IMPACT OF A CONTEXTUAL INTERVENTION TO IMPROVE ACTIVITY PARTICIPATION IN CHILDREN WITH AUTISM SPECTRUM DISORDER

DISSERTATION SUBMITTED
FOR
MASTER OF OCCUPATIONAL THERAPY
2014 – 2016

K | M
C | H

K.M.C.H. COLLEGE OF OCCUPATIONALTHERAPY

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

CHENNAI

CERTIFICATE

This is to certify that the research work entitled IMPACT OF A CONTEXTUAL INTERVENTION TO IMPROVE ACTIVITY PARTICIPATION IN CHILDREN WITH AUTISM SPECTRUM DISORDER was carried out by Reg.No.411414002, KMCH College of Occupational Therapy, towards partial fulfillment of the requirements of Master of Occupational Therapy (Advanced OT in Pediatrics) of the Tamil Nadu Dr. M.G.R. Medical University, Chennai.

_____

Guide

Mrs. Sujata Missal
M.Sc. (OT), PGDR. (OT)
KMCH College of
Occupational Therapy

_____

Principal

Mrs. Sujata Missal
M.Sc. (OT), PGDR. (OT)
KMCH College of
Occupational Therapy

_____

Clinical Guide
Dr. K.Rajendran
Consultant Pediatrician and Neonatologist
Head of Pediatric Department
Kovai Medical Center and Hospital, Coimbatore

_____

Internal examiner

_____

External examiner

ACKNOWLEDGEMENT

"Give thanks to the Lord for He is good; His love endures forever"

First of all I thank the **"LORD ALMIGHTY"** for giving me the strength and insight to complete this study and also for the abundant goodness always.

My deepest gratitude to my dear parents and sister for their prayers and support which was a blessing for me.

My sincere thanks to my guide and principal **Mrs. Sujata Missal M.Sc. (OT), PGDR (OT)** for her commitment, time, patience and knowledge inculcated in me throughout this study.

I am grateful to **Mrs.Sugi M.O.T** for her valuable advice, support, effort and encouragement provided during topic selection, ethical committee presentation, validation of HCAS scale and statistical analysis.

I thank the Vice Principal **Mr. S.G Praveen, M.O.T** for his valuable suggestions which was helpful for me in completing the study.

I express my gratitude to my clinical guide **Dr K. Rajendran (Head of Pediatric Department)** for his guidance, time and suggestions which helped me during the study.
I extend my thanks to Mrs. Anurupa Senapati, M.O.T for her valuable time in validating the HCAS scale.

I also take this opportunity to thank all my dear classmates Suja, Sophia, Ameera , Jancy and also to **Ms Swati M.O.T** for all their timely help and support in various aspects of this study . I am also grateful to my dear friends Rijo, Deepa and Selva for all their help and encouragement.

I also express my heartfelt gratitude to all the mothers and children who participated in this study. Finally I thank each and every one who supported me and helped me in completing this study successfully.

ABSTRACT

Aim:

To study the effectiveness of contextual intervention to improve activity participation in children with autism spectrum disorder.

Method:

A quasi experimental pre-post test design was adopted for the study in which mothers of 30 children with ASD were recruited out of which 15 children in the experimental group underwent contextual intervention and conventional occupational therapy and 15 children in the control group underwent only conventional occupational therapy. The study duration was 12 weeks which was conducted across four timelines T1-T2, T2-T3,T3-T4 and T1-T4. The scales administered were COPM (Canadian Occupational Performance Measure), GAS (Goal Attaintment Scale), PSOC (Parent Sense of Competence Scale), SSP (Short Sensory Profile) and HCAS (Home and Community Activities Scale). There were 10 sessions of intervention and the duration of each session was 45-60 minutes.

Results:

The children in experimental group showed significance in effectiveness on performance scores of COPM ($\eta p2=0.922$), the mothers showed significance in effectiveness on satisfaction scores(($\eta p2=0.916$), GAS scores ($\eta p2 =0.897$), efficacy scores on PSOC($\eta p2=0.960$) and satisfaction scores on PSOC($\eta p2=0.969$).

Conclusion:

This study concludes that contextual intervention lead to significant improvement in children's participation in ways that parents found useful and also partnering with parents to find strategies to achieve their goals leads to the parents feeling more competent in their parenting role.

ABBREVIATIONS

ASD: Autism Spectrum Disorder

COPM: Canadian Occupational Performance Measure

GAS: Goal Attainment Scale

HCAS: Home and Community Activities Scale

PSOC: Parental Sense of Competence Scale

SSP: Short Sensory Profile

T1:Test 1

T2:Test 2

T3:Test 3

T4:Test 4

INTRODUCTION

Family centered practice (Dunst,et al., 2006) emphasizes on practioner- caregiver partnerships and principles such as use of family resources to generate solutions to family identified goals and interventions in authentic contexts. Occupational therapy for children with autism spectrum disorder ideally focuses on the goals that parents hold for their children. This approach to family-centered care underscores dignity and respect for families. Family-centered care takes place in a milieu in which families and occupational therapy practitioners are equally involved in information exchange, empowering families to make informed decisions and thereby enabling practitioners to be responsive to families' priorities and choices (American Academy of Pediatrics, 2012). When family-centered care approaches are used, practitioners listen to parents' concerns and integrate their professional knowledge with observations of children's performance to collaboratively negotiate goals with parents (Cohn, et al., 2014).

Children with ASD are particularly at risk for limited activity participation, and several studies have shown that children with ASD participate in activities less frequently and with less variety than do children with other developmental disabilities and typical development (e.g., LeVesser & Berg, 2011; Rodger & Umaibalan, 2011). Research suggests that children with ASD participate less frequently and with less variety in activities than do typically developing children (LeVesser & Berg, 2011; Rodger & Umaibalan, 2011) and those with DD (Marquenie, et al., 2011). Preschoolers with ASD have been found to participate less frequently in self-care, community mobility, vigorous leisure, and sedentary leisure than do children with typical development (LeVesser & Berg, 2011). Caregivers of preschool children with ASD report less frequent and less diverse activity participation (Lam, et al., 2010). Special event activities, such as birthday parties and family vacations, have also been reported as less frequent among preschool and school-age children with ASD (Rodger & Umaibalan, 2011).

Specifically, the participation of school-age children with ASD appears to occur less frequently than that of typically developing children in unstructured activities; social

activities; and hobbies, such as recreational and after-school activities (Hochhauser & Engel-Yeger, 2010; Reynolds, et al., 2011). Similarly, adolescents with ASD have been found to participate less frequently in recreational activities and community activities such as after-school clubs and organizations than typically developing children and those with other DD (Lee, Harrington, et al.,, 2008; Orsmond,et al., 2004; Solish,et al; 2010).

Parents of children with ASD identify occupational therapy as one of the most frequently requested and used services for their children (Mandell & Levy, 2005) and occupational therapy using sensory integration as one of the most preferred choices (Goin-Kochel, et al, 2007). An estimated 45% to 90% of children with ASD demonstrate sensory-related difficulties (Ben-Sasson et al., 2008), and these difficulties are a key factor influencing participation in daily activities (Baranek, 2012; Hilton, et al.,, 2007; Schaaf, Toth- Cohen, Johnson, Outten, & Benevides, 2011). Consequently, parents often request that occupational therapy intervention address sensory-related factors that have an impact on their child's participation in daily activities. Thus it becomes increasingly important for practitioners to use family-centered care practices to negotiate goals and to communicate with families their reasoning regarding the ways in which difficulties in sensory integration may be affecting the everyday function of children in the context of home, school, and community (Parham & Mailloux, 2015).

Contextual intervention is a therapy approach focusing on changing the task and the environment rather than children's impairments. A unique aspect of the context therapy approach is that therapists are trained to change only the characteristics of the task and/or environment and not to try to change the child's impairments. Context therapy emphasizes changing the parameters of the task or environment rather than a focus on remediation of a child's abilities. The assumption of this approach is that changes to the task and/or environment will enable the child to perform an activity that they were unable to do previously. Tenets of family-centered theory were also integrated into the development of the context therapy protocol, particularly the concept of a collaborative partnership between families and health care providers. Families participated in the identification both of goals and intervention strategies for their children.

A three-step process is involved for the context therapy intervention: goal identification, assessment, and intervention strategies.

Contextual intervention was based on dynamic systems wherein success at functional goal depends on interaction of factors within child, task and environment subsystems which emphasizes on changing task and environment rather than child. It is also based on family centered collaborative relationship between family and health-care providers to identify goals and intervention strategies wherein family involvement is incorporated into assessment and intervention protocol and not left to individual therapist discretion. Service delivery model was natural environment assessment and intervention ideally occurs in natural environment directly related to identified goal or task. Parents were involved in identification of functionally relevant goals. Families identify strategies with therapists and families demonstrate present strategies and build from there. Contextual intervention can be facilitated by altering the environmental arrangement, presentation of a visual schedule, presentation of verbal warning to signal impending transition or by modifying the task according to the sensory issues affecting the child. The drawback of this intervention is that it focuses on changing the parameters of task and environment rather than remediating the child's abilities. The need for conducting this study is that previous literature (LeVesser & Berg, 2011; Lauren M. Little et al.,2014) has shown that children with ASD participate in activities less frequently and also studies do not address intervention for improving activity participation.

Need for the study

- Studies have shown that children with ASD participate in activities less frequently.
- Studies have not explored the difficulty associated with activity participation among children with ASD.
- There are only very few studies addressing intervention for improving activity participation.
- In India, the concept of contextual intervention is not much established so this study can help to analyze its effect for children with ASD.

Research question:

Do children with autism increase their participation in activities following contextual intervention?

OPERATIONAL DEFINITIONS

- **Activity** is the execution of a task or action by an individual.
- **Participation** is involvement in a life situation.
- **Occupational performance :** It is a meaningful sequence of actions in which the person enacts and completes a specified task that is relevant to his or her culture and daily life roles.
- **Occupational performance roles ;** They are patterns of occupational behaviour composed of configurations of self-maintenance, productivity, leisure and rest occupations. Roles are determined by individual person-environment-performance relationships. The roles of children includes play, school and sleep. They are established through need and/or choice and are modified with age, ability, experience, circumstance and time
- **Occupational performance areas :** They are categories of routines, tasks and sub-tasks performed by people to fulfill the requirements of occupational performance roles. The categories for children include self-maintenance occupations, school occupations, play occupations and rest occupations.

AIMS AND OBJECTIVES

Aim:

To study the effectiveness of contextual intervention to improve activity participation in children with ASD.

Objectives:

- To link sensory factors to participation
- To establish intervention goals for parents for activity in children with ASD
- To find out the effectiveness of contextual intervention in activity participation

HYPOTHESIS

Alternate Hypothesis

Contextual intervention will be effective for improving activity participation in children with ASD

Null Hypothesis

Contextual intervention will not be effective for improving activity participation in children with ASD

RELATED LITERATURE

Coaching is an interactive process to promote a care provider's ability to support a child's participation in everyday .Coaching is an evidence based intervention method that is family centered and promotes adult learning (Mc William, 2010;Rush&Sheldon,2011). Coaching occurs in family settings ,promotes parent directed goals and solutions, builds parents capacity to identify and implement interventions during life routines (Dunst et al., 2006; Graham, Rodger, and Zivani, 2010).experiences & interactions across settings .The role of the coach is to mobilize experiences, interactions and opportunities in conjuction with mediating the person's deeper understanding of what is or could be working in order to reach the end goal .the more the person's capacity has been built (i.e.,increased confidence and competance), the better the person becomes at more independantly achieving his/her desired outcomes now and in the future.

Common principles of coaching

- Reciprocal communication relationship
- The 'coachee' identifies the issues
- The focus is on solving the problem
- Solutions grow out of the 'coachee's' insights
- Solutions are situated within authentic settings and activities

Reflective questioning:

Coaching involves reflective questioning which has the following steps:

- Awareness
- Analysis
- Alternatives
- Action

Contextual intervention:

A therapy approach focusing on changing the task and the environment rather than children's impairments.A unique aspect of the context therapy approach is that therapists

were explicitly trained to change only the characteristics of the task and/or environment and not to try to change the child's impairments.Context therapy emphasizes changing the parameters of the task or environment rather than a focus on remediation of a child's abilities. The assumption of this approach is that changes to the task and/or environment will enable the child to perform an activity that they were unable to do previously.Tenets of family-centered theory were also integrated into thedevelopment of the context therapy protocol, particularly the concept of a collaborativepartnership between families and health care providers.Families participated in the identification both of goals and of intervention strategies for their children.

A three-step process is involved for the context therapy intervention: goal identification, assessment, and intervention strategies.

Contextual intervention was based on dynamic systems wherein success at functional goal depends on interaction of factors within child, task and environment subsystems which emphasis on changing task and environment rather than child. It is also based on family centered collaborative relationship between family and health-care providers to identify goals and intervention strategies wherein family involvement is incorporated into assessment and intervention protocol and not left to individual therapist discretion.Service delivery modelwas natural environment assessment and intervention ideally occurs in natural environment directly related to identified goal or task. Parents were involved in identification of functionally relevant goals.Families identify strategies with therapists and families demonstrate present strategies and build from there .Assessment include families strength-based focus on identifying constraints and facilitators related to task and environment.

Assessment tools incorporating coaching outcomes:

Goal Attainment Scaling - GAS is a goal-setting process used to determine intervention outcomes expressly relevant to individuals and their families. GAS is able to depict functional and meaningful outcomes that are often challenging to assess using standardized measures (Mailloux et al., 2007). In various studies, GAS has been

determined to be an effective outcome measure (Mailloux et al., 2007; Miller et al., 2007). Many studies in recent years has used GAS as the main outcome measure.

In one of the studies, the goals were developed in conjunction with the primary caregiver by the researchers/ evaluators and individualized for the child. The goals were shared with the interventionists to guide treatment planning and was used to find out Effectiveness of Sensory Integration Interventions in Children With Autism Spectrum Disorders(Beth A. Pfeiffer et al,2011)

Canadian Occupational Performance Measure (COPM) : It has been 73 years since the Canadian Occupational Performance Measure (COPM) was published. In that time there has been a remarkable growth in its acceptance as an outcome measure within the occupational therapy practice and research. It is evidenced by its extensive use as the gold standard against which other measures of client valued performance are evaluated (Carswell et al., 2004). It has been found that the COPM is used with a wide variety of clients, enables client-centred practice, facilitates evidence-based practice and supports outcomes research.

The COPM has been used successfully with a wide variety of patients, from children and their families to adult patients coping with various illnesses, disabilities, and life circumstances (Atwal et al,2003)

Parenting sense of competence scale : Parenting self-efficacy has been strongly associated with parenting competence and child developmental outcomes (Shumow & Lomax 2002; Jones & Prinz 2005). Jones and Prinz (2005) identified the Parenting Sense of Competence (PSOC) scale as the most commonly used tool for measuring parental self-efficacy.

REVIEW OF LITERATURE

- **Activity particiation in children with ASD:**

A study on activity participation among children with autism spectrum disorder by Little, et al.,(2014): The purpose of this study was to empirically derive dimensions of activity participation among a sample of 713 school-age children with autism spectrum disorder .Additionally, the associations between dimensions of activity participation and child characteristics (i.e., chronological age, autism severity, gender) and family demographics (i.e., maternal education) were examined. Exploratory factor analysis was used to determine the factors on the Home and Community Activities Scale (HCAS). Multiple regression was used to examine the extent to which child characteristics and family demographics were related to HCAS dimensions. A six-factor model best characterized activity participation among the school-age children with ASD, and child characteristics and family demographics were differentially associated with HCAS dimensions. The findings have implications for how activities may be categorized for children with ASD and suggest that the frequency of specific activities is affected by child characteristics and maternal education.

A study on children with autism spectrum disorder and patterns of participation in daily physical and play activities by Amir Hossein Memari, et al.,(2015): Daily physical activity involvement was investigated in a total of 83 children (52 boys and 31 girls) with ASD aged 6–15 years. Results indicated that only 10 (12%) of children with ASD were physically active. Children were predominantly engaged in solitary play rather than social play activities. Gender, family income, and household structure were found to be associated with activity scores. Financial burden and lack of opportunities were noted as the leading barriers to physical activities. In conclusion, findings indicated a low rate of physical activity participation in children with ASD that is closely associated with socio demographic variables.

A study on out-of-school participation patterns in children with high-functioning autism spectrum disorders by Hilton, C. L et al., (2008): This study examined differences in out-of-school activity participation between typically developing children and those with high-functioning autism spectrum disorders (HFASD). Children with HFASD, ages 6 to 12 (N = 52), and a control group (N = 53) were assessed using the Children's Assessment of Participation and Enjoyment and the Social Responsiveness Scale. Results indicated significant differences in participation between typical and HFASD groups in number of activities in which children participate, the numbers of individuals with whom they participate, and the variety of environments in which they participate.These findings indicate that out-of-school participation is significantly different for children with HFASD than for typically developing peers. Findings suggest that social impairment is related to some aspects of participation and that addressing social skills in intervention could contribute to increased participation in out-of school

activities by children with HFASD, which would contribute to their long-term mental and physical health.

A study on the everyday occupation of families with children with autism by Werner DeGrace, B., (2004): The purpose of this qualitative research study was to understand a family's experiences negotiating family daily life and the meanings they ascribed to these experiences when they had a child with severe autism. In-depth, semi-structured interviews were conducted with five family units. The interviews explored the meaning of the family's participation in daily life activities. The transcribed interviews were analyzed with a phenomenological method. The results emerging from this study indicate that families with children with severe autism may experience difficulty engaging in daily activities that hold positive meaning and rely on stringent patterns of routines that revolve around the child with autism to meet the demands of daily life.

A study on activity participation and sensory features among children with autism spectrum disorders by Lauren M. Little,et al.,(2015): Sensory features are highly prevalent among children with autism spectrum disorders (ASD) and have been shown to

cluster into four patterns of response, including hyperresponsiveness, hyporesponsiveness, enhanced perception, and sensory interests, repetitions and seeking behaviors. Given the lack of large-scale research on the differential effects of sensory response patterns on children's participation in specific activities, this study investigated the extent to which sensory response patterns impacted six dimensions of children's activity participation as measured by the Home and Community Activities Scale among a large, national sample of school aged children with ASD (n = 674). Using mixed model regression, results showed that sensory response patterns differentially impacted dimensions of activity participation, and associations were moderated by a number of child characteristics.

A study on linking sensory factors to participation: establishing intervention goals with parents for children with autism spectrum disorder by Schaaf, R. C, et al., (2015):. This article describes an exploratory analysis of 160 parent-identified goals for children with autism as parents often focus on independence in activities of daily living and social participation when setting goals for their children with autism spectrum disorders. Occupational therapy practitioners use clinical reasoning to translate these goals to define occupation-based outcomes. They identified sensory integrative factors hypothesized to influence each goal and then categorized the goals using the Occupational Therapy Practice Framework: Domain and Process and the International Classification of Functioning, Disability and Health (ICF). Most goals were at the ICF participation and activity levels. Activities of daily living were the most common area of occupation identified, followed by social participation and play. Sensory reactivity and somatopraxis were the most frequently occurring sensory integrative factors. The value of addressing parent goals using a systematic reasoning process to identify factors affecting participation and the importance of measuring participation outcomes are discussed.

A study on relationship between context and sensory processing in children with autism by Brown, N. B., & Dunn, W. (2010).: The purpose of the study was to determine the relationship between sensory processing and context for children with autism. The home and school contexts were examined using the Sensory Profile (Dunn,

1999) and the Sensory Profile School Companion (Dunn, 2006a) questionnaires. Teachers of 49 students with autism completed the Sensory Profile School Companion, and parents completed the Sensory Profile. Analyses using the avoiding and seeking quadrant scores from the School Companion and corresponding avoiding and seeking quadrant scores from the Sensory Profile. Results showed that the avoiding quadrant score coefficient and the seeking quadrant score coefficient were statistically significant with good and fair correlations, respectively, suggesting that sensory processing patterns have both universal qualities and context-specific qualities in children with autism. Findings from this study provide initial evidence that sensory processing and context for children with autism are related.

A study on sensory processing abilities and their relation to participation in leisure activities among children with high-functioning autism spectrum disorder (HFASD) by Department of Occupational Therapy, Faculty of Welfare and Health Sciences, University of Haifa, Mount Carmel, Haifa, Israel (2010): This study aimed to characterize the sensory processing abilities of children with HFASD and examine their relationship to participation in leisure activities. Participants were 50 children aged 6–11 years: 25 children with HFASD and 25 with typical development. Sensory processing abilities were examined by the short sensory profile (SSP). Participation was assessed by the children's assessment of participation and enjoyment (CAPE). Children with HFASD had atypical sensory processing abilities. They also had lower participation in leisure activities expressed in limited range of activities, performed less often, mainly alone and at home. Their atypical sensory processing patterns were correlated with lower participation, specifically in social, physical and informal activities. In conclusion, children with HFASD may have atypical sensory processing abilities and restricted participation. Intervention should refer to each of these parameters and to the relationship between them in order to enable optimal inclusion of children with HFASD in society.

A study on physical activity participation in children with autism spectrum disorders: an exploratory study by Atara Engel(2011): The purpose of the study was to describe the physical activity habits of children with ASD and the barriers and

facilitators to optimal participation. Twenty-three parents of children with ASD reported on their child's physical activity habits, perceived barriers to participation, and functioning. A rating scale was applied to score responses and children were classified into functional level groups and physical activity level groups. Results indicated that on an average, children were reported to meet or exceeded national physical activity frequency guidelines, belonged to active families and participated in a variety of physical activities. Parents identified several barriers to optimal physical activity for their children. Conclusions: Children with ASD can attain optimal physical activity. Exposure to a variety of physical activity opportunities and experiences aids in identifying the ideal activity for each individual child.

A study on family routines and rituals a context for development in the lives of young children Mary Spagnola, Barbara H. Fiese, (2007): In this study recent evidence is highlighted which suggests that variations in the practice of family routines and the meaning connected to family rituals are associated with variations in socio emotional, language, academic, and social skill development. We offer definitions of routines and rituals and contrast their different elements. We briefly review how variations in routines have been found to be associated with variations in language development, academic achievement, and social skill development. Examination is done on how variations in the emotional investment in family rituals are associated with variations in family relationship satisfaction. Potential mechanisms of effect (parental efficacy, behavior monitoring, family relationship coherence) are discussed. Conclusion involves a brief description of methods of assessment and intervention suitable for practitioners working with families of young children.

A study on caregiver strain and sensory features in children with autism spectrum disorder and other developmental disabilities by Anne V. Kirby,A et al.: Caring for children with disabilities contributes to increased levels of parent stress, or caregiver strain. However, the potential relationship of sensory features to strain among caregivers of children with autism spectrum disorder (ASD) and other developmental disabilities (DD) is unknown. Sensory features include over-reactions, under-reactions, and unusual

interests in sensations, which may negatively impact family functioning. This descriptive study confirmed three caregiver strain types (i.e., objective, subjective internalized, subjective externalized) and explored differences among ASD (n=71) and DD (n=36) groups, with the ASD group reporting higher levels. Furthermore, this study explored the contribution of sensory features to caregiver strain, finding differential contributions to strain in the ASD group and covariate contributions (i.e., child cognition, mother's education) in the DD group.

A study on influences of contrasting natural learning environment experiences on child, parent and family well-being by Carl J. Dunst, et al.,(2006): Findings from a study examining the parent, family, and child well-being outcomes associated with different ways of conceptualizing natural learning environment practices are presented. One sample was asked to indicate the extent to which early intervention practitioners implemented their interventions in everyday family or community activities, and one sample was asked to indicate the extent to which everyday family or community activities were used as sources of child learning opportunities. Results showed that using everyday activities as sources of children's learning opportunities was associated with positive benefits, whereas practitioners' implementing interventions in everyday activities showed little or no positive benefits and in a number of analyses had negative consequences.

- **Other interventions for activity participation:**

A study on occupational therapy using sensory integration to improve participation in a child with autism: case report by Schaaf,R.C, et al.,(2012): In this case report the changes in adaptive behaviors and participation of one child with autism is described during a 10 week program of intensive occupational therapy using a sensory integrative approach (OT-SI). The results indicated improvement in sensory processing , as measured by the Sensory Integration And Praxis Tests as well as enhanced participation in home , school and family activities as indicated on parent rated goal attainment scales.

A study on increasing participation in the classroom for children with autism spectrum disorders by Heather Vining (2011): The purpose of this study was to investigate one of the naturalistic interventions, the Competent Learner Model, and determine its effects on the participation and social skills of students with autism. Three middle school male students diagnosed with autism from a rural northeast middle school participated in the study. They were assessed using the Competent Learner Repertoire Assessments of the Competent Learner Model and the adaptive measures of the Vineland-II and ABASII. The results showed improvement for one of the three students and little to no improvement for the other two students.

A study on increasing physical activity in individuals with autism by Teri Todd and Greg Reid (2006): This study investigated the outcomes of an intervention package on participation in two physical activities: snowshoeing and walking/jogging. Three male secondary school students who had been diagnosed with autism and were attending a school for students with intellectual disabilities participated in a 6-month outdoor physical activity program. The authors used a changing conditions design; the program was divided into six phases by the amount of edible reinforcers provided during sessions. A self-monitoring board, verbal cuing, and edible reinforcers were used in the study. Distance snowshoed, walked, and jogged per 30-min session increased as edible and verbal reinforcement decreased. The results suggest that interventions can be developed to promote sustained participation in physical activity for individuals with autism.

A study on embedding social reinforcers into lunchtime activities in children with autism spectrum disorders by Erin Engstrom et al.,: Within the context of a multiple baseline design across participants, we assessed whether embedding social reinforcers into lunchtime activities would increase socialization between students with ASD and typical peers. Preliminary data suggest that embedding social reinforcers into lunchtime activities increases the target student's levels of engagement with typical peers and increases the rate of initiations made by the target student to typical peers.

- **Contextual assessment and intervention:**

A study on impact of contextual intervention on child participation and parent competance among children with autism spectrum disorders: A pretest- posttest repeated measures design by Winnie Dunn, et al.,(2012): In this study occupational therapy contextual intervention was used for improving participation in children with autism spectrum disorders and for developing parental competance. The effectiveness of contextually relevant reflective guidance occupational therapy intervention involving three components :authentic activty settings, family's daily routines and the child's sensory patterns was evaluated were 20 parents were involved. Sessions involved reflective discussion with parents to support them in identifying strategies to meet their goals and make joint plans for the coming week. Child participation was measured using COPM and GAS and parental competance using Parenting sense of competance and parenting stress index. Results indicated that parents felt more competant and children significantly increased participation in everyday life, suggesting that this appraoch is efective in occupational therapy intervention.

Evaluating the effectiveness of contextual intervention for adolescents with autism spectrum disorders-Mary Kientz & Winnie Dunn (2012): The effectiveness of contextual intervention to increase participation in self- or parent-identified activities for adolescents with autism spectrum disorders (ASD) was evaluated. The eight- session intervention involved the use of coaching principles to convey information, everyday routines, and authentic settings and sensory processing information to support adolescent and parent problem solving. Results indicate that the adolescents significantly increased their participation in everyday activities important to them and sustained this increase in participation after the completion of the study. The results suggest that contextual intervention using coaching principles is an effective intervention.

A study on context-based assessment and intervention for problem behavior in children with autism spectrum disorder by Sanja I. Cale, et al., (2009): This study used a context-based model of assessment and intervention to explore whether interventions that modify context result in reduction of problem behavior in ecologically valid settings (i.e., typical routines implemented by typical education personnel in neighborhood schools). The Contextual Assessment Inventory (CAI) and a post assessment interview were administered to parents and teachers of eight children with Autism Spectrum Disorder to identify problem contexts. Then, environmental modification techniques were implemented in three priority contexts: namely, transitions, termination of preferred activities, and presence of a feared stimulus. The results demonstrated an almost complete elimination of problem behavior in the priority contexts as well as successful completion of activities and routines related to those contexts. The value of conceptualizing problem behavior as a function of context with respect to facilitating both assessment and intervention, and the need for enhancing breadth of effects to determine the larger impact of a context based approach on promoting meaningful behavior change in the community was discussed.

A study on context therapy: a new intervention approach for children with cerebral palsy by Johanna Darrah, et al.,(2012): In this study therapists were trained to change task and environmental factors to achieve parent identified functional goals for children with cerebral palsy. Therapists did not provide any remediation strategies to change the abilities of the child. Theoretical constructs were developed using dynamic systems theory and the principles of family-centered care. A primary therapist model was used. A three-step intervention strategy was developed. Therapists adhered to the treatment protocol. Parents participated in the development of both functional goals and intervention strategies. A therapy approach focusing on changing the task and the environment rather than children's impairments can be a viable treatment strategy and merits further investigation. The detailed description of the context therapy approach allows replication by both researchers and clinicians. Such intervention descriptions are an important methodological consideration in rehabilitation research.

CONCEPTUAL FRAMEWORK

Activity participation is a major concern of occupational therapists regarding children with autism. In children the activities which are of importance to them include school activities, play, outdoor and community activities. The contextual intervention is based on Person, Environment Occupation model.

Various factors could be present which hampers their participation and this includes:

Person: Here the child's sensory patterns like over responsiveness / under responsiveness or difficulty in sensory processing can affect their participation.

Environment: The environment / context can be too overwhelming for the child which affects their participation.

Task / Activity: The task can be too demanding for the child in terms of difficulty, duration, etc.

Majority of studies focus on person / child rather than the environment and task to improve participation.

Therefore, this study focuses on modifying the task / environment of the child so that they function adequately. Here the focus is mainly on environment / task rather than the individual because the sensory issues of the child cannot be easily resolved within a particular time period but in spite of this the child has to participate adequately.

The model which focuses on this interaction between person, environment & occupation is the PEO model which was developed by Law et al.(1996). This is a well established model which adapts a transactional rather than interactive approach towards relation between person & environment. This model has 3 components:

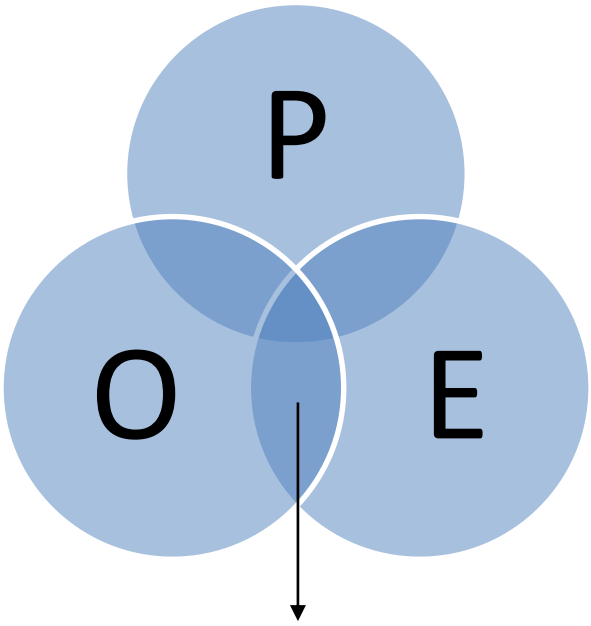
- Person
- Environment
- Occupation

The interaction between the three components results in adequate occupational performance.

The interaction is important between these components as, intervention is directed on person, environment and occupation to optimize occupational performance. These 3 elements are dynamic and continue throughout the child's life span. There are different interactions which occur in these components.

This model provides a framework for systemic interaction of analysis between:

- Person & environment
- Person & occupation
- Environment & occupation



Occupational performance

- Person / child: Is a unique being who has multiple roles and who cannot be separated from contextual influences. Roles can differ in degree of importance depending on environment & developmental stages of child.
- Environment: This is the context within which occupational performance takes place & can be categorised into cultural, socio-economic, physical or social. Demands about expected outcomes are received from environment continuously.
- Occupation: They are self directed meaningful tasks in which the child is engaged in, throughout their life span. Areas of occupation can be self care, productivity & leisure. Occupations are engaged in to satisfy an intrinsic need for self maintenance and satisfaction and are carried out in multiple contexts.

Occupations can be analysed based on

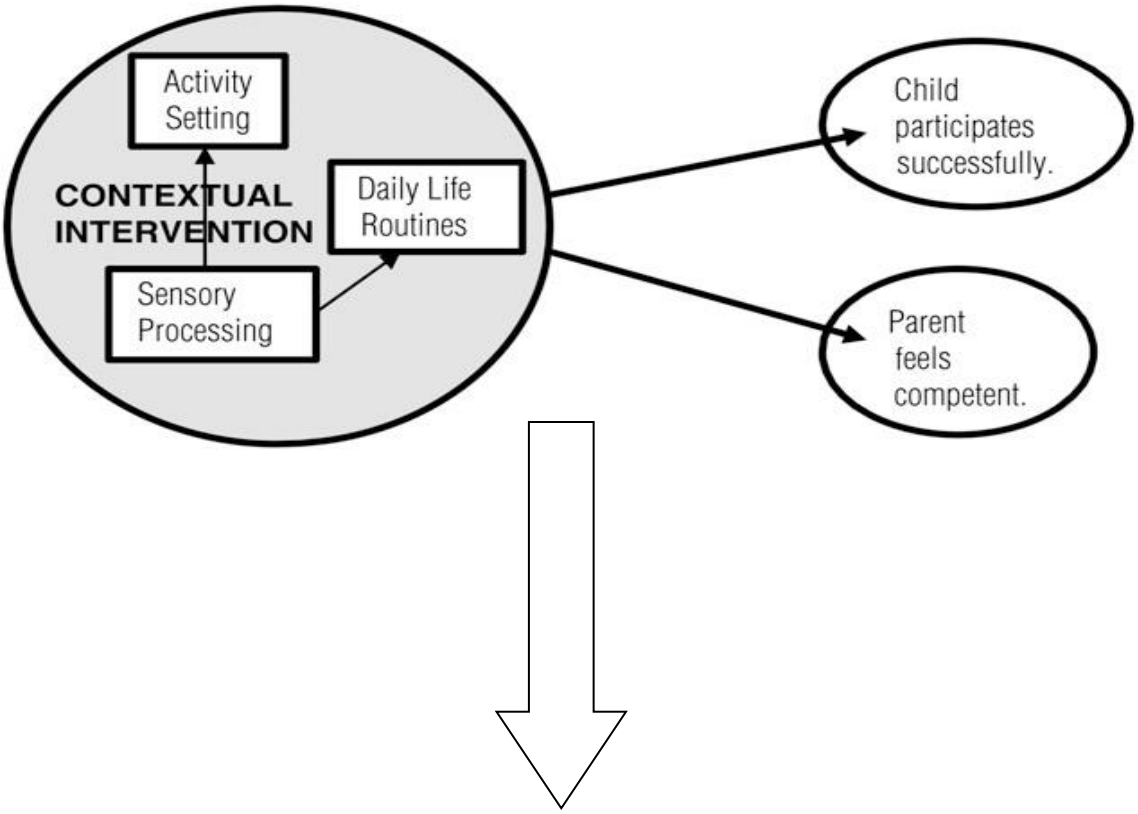
- Characteristics of tasks
- Degree of structure
- Duration of activity
- Complexity of tasks

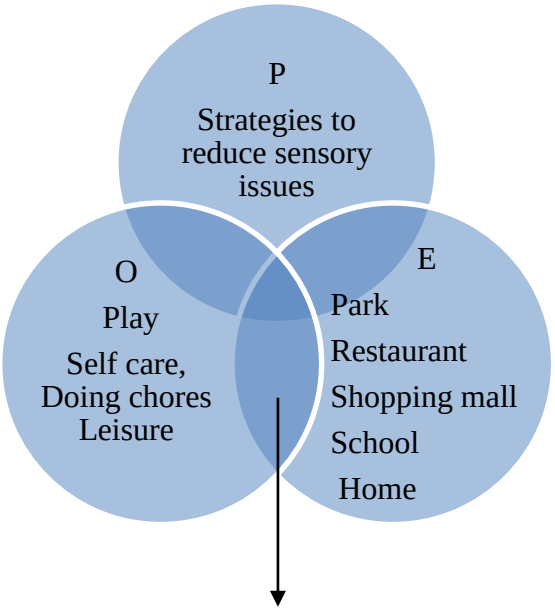
Function – dysfunction continuum:

Optimal functioning / occupational performance results from a good fit between these components (P-E-O)

Maximum fit relates to optimal performance whereas minimum fit relates to minimum occupational performance.

This study targets on environment & occupation changes to improve participation of children. Intervention here is implemented within authentic activity settings wherein either the task / environment is modified according to abilities of child to increase participation and thereby occupational performance. Change in outcome is measured in terms of occupational performance as the focus of the model is on occupation rather than performance components.





Occupational performance

METHODOLOGY

Research design:

The aim of the study was to find the impact of contextual intervention in improving activity participation in children with ASD hence used a quasi experimental pre-post test design.

Experimental group underwent conventional occupational therapy and contextual intervention and control group underwent only conventional occupational therapy.

The Kovai Medical Centre and Hospital institutional review board granted approval for the study.

Place of the study:

This study was conducted in Occupational Therapy Department, Kovai Medical Centre and Hospital, Coimbatore.

Variables:

- Independent variables – Contextual intervention
- Dependent variables – Activity participation, self-competence and satisfaction
- Extraneous variables – Parental regularity in attending sessions, severity of illness.

Sampling:

Convenience sampling

Sample size:

The study includes 30 samples

- Experimental group: 15
- Control group: 15

Inclusion criteria:

- Children diagnosed with autism by a Psychiatrist
- Children in the age group 2- 15 years
- Both the gender

Exclusion criteria:

- Children with developmental delays or other physical disabilities.
- Mothers who had history of psychological issues or any form of mental illness

Outcome measures:

- Occupational performance of children
- Activity participation in children
- Attainment of goals by mothers
- Parental competence

TOOLS USED:

- **Canadian Occupational Performance Measure**

COPM is a criterion-based measure of occupational performance in which clients rate the level of importance of, performance of, and satisfaction with goals in self-care, productivity, and leisure on a 10-point scale. A change of 2 or more points in the mean score on the COPM has been reported to indicate clinically significant change. Goals are identified as being of concern during a semi structured interview. The COPM was developed to detect change in self perception of occupational performance and satisfaction over time in persons with variety of disabilities. In a systematic review, Carswell states that the COPM is a valid, reliable and clinically useful tool to measure

change in occupational performance and client satisfaction with the outcome of therapy (Careswell 2004).

- **Goal Attainment Scale (GAS)**

GAS is an individualized, criterion-based measure of goal attainment in which goals are determined through interview with clients. Goals are mapped against a 5-point scale in which each step of the scale indicates improvement ranging from current performance to beyond expected performance.

Interrater reliability is described as good in literature reviews but does appear to vary according to the precision with which the levels are described, the person writing the scale and the person scoring the scale. It is moderate when one rater observes the patient directly and the other views video recordings (k =0.61-0.66) .In the pediatric field of rehabilitation the reliability is 0.65–0.92 which signifies excellent reliability.

The **content validity** will depend on the setter's objectivity and ability to anticipate the range of possible outcomes based on their knowledge of the pathology, of the patient's potential and of the available therapeutic resources.

Criterion concurrent validity :The GAS scores are poorly or not at all correlated with standard scales used in routine practice in rehabilitation in the fields of geriatrics, cognition , neurological disease, orthoses and paediatrics.

- **Parental Sense of Competence (PSOC)**

The PSOC is used to identify changes in parenting competence after OPC. It is a 16 item Likert-scale questionnaire (on a 6 point scale ranging from strongly agree [1] to strongly disagree [6]), with nine questions under Satisfaction and seven under Efficacy. Satisfaction section examines the parents' anxiety, motivation and frustration, while the Efficacy section looks at the parents' competence, capability levels, and problem-solving abilities in their parental role.

The **construct validity** was reported as a good fit and accounted for 40-54%, 43-52%, and 36% of the variance in the father, mother (Ohan et al, 2000; Rogers and Matthews, 2004; Gilmore and Cuskelly, 2008), and both (Johnston and Mash, 1989), respectively. The reported internal consistency using Cronbach's alpha coefficient ranged from 0.79 to 0.87 (Knauth, 2000; Gilmore and Cuskelly, 2008; Herren et al, 2013) Cronbach's alpha coefficients were 0.79, 0.73, and 0.79, for total scale, skill/ knowledge subscale, and valuing/comfort subscale, respectively, indicating acceptable reliability.

- **Home and Community Activities Scale (HCAS):**

  HCAS is an 83-item parent-report instrument used to characterize the frequency with which children participate in activities of daily life in the home and community. Caregivers rated the frequency of the child's participation in each activity on a scale of 0 (never), 1 (monthly), 2 (weekly), or 3 (daily).

  Content validity was established by two experts of the same field (pediatrics) within a duration of one month and it was found to have good content validity.

- **Short sensory profile (SSP):**

  Short Sensory Profile is used to measure the responses of children to sensory event in daily life. There are 7 main items. Each item has sub items which are statements;

  Tactile sensitivity: 7

  Taste/smell sensitivity: 4

  Movement sensitivity: 3

  Under responsive/seeks sensation: 7

  Auditory filtering: 6

  Low energy/weak: 6

  Visual / auditory sensitivity: 5

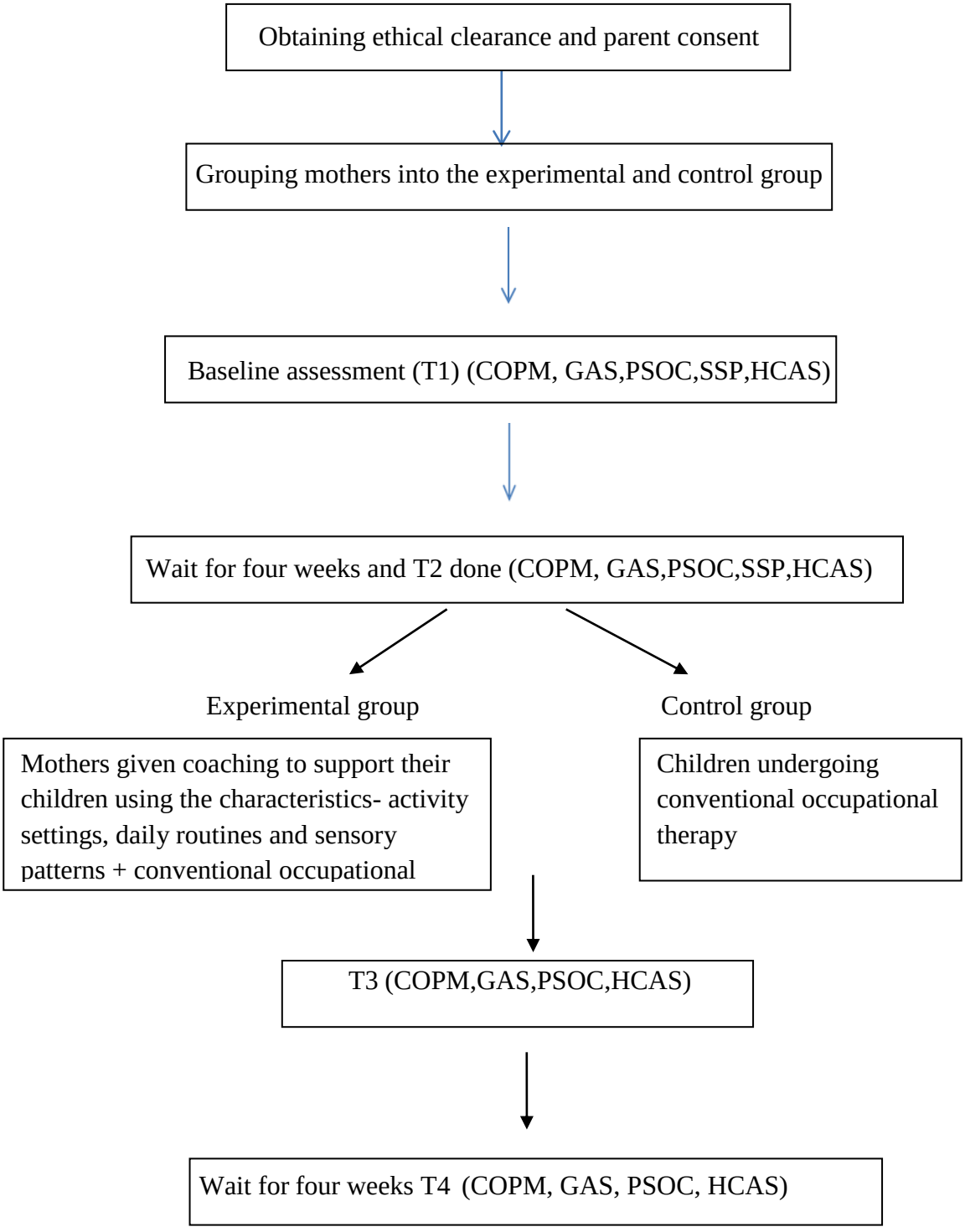
Reliability: Test reliability is an indication of the degree to which a test provides a precise and stable score. Cronbach's coefficient alpha was calculated to examine the internal consistency for each section of the Sensory Profile. Internal consistency indicates the extent to which the items in each section measure a single construct. The values of alpha for the various sections ranged from .47 to .91.

Procedure:

There are four tests conducted in the study

- TEST 1-TEST 2: (baseline)- Do outcomes change over a 4week period without additional intervention
- TEST 2-TEST 3: Is the intervention effective?
- TEST 3-TEST 4:Are the effects sustained without contact
- TEST 1-TEST4: Are there overall changes from the first to last meeting?

Summary of steps followed in the study:



Contextual intervention

The experimental group of mothers underwent 10 sessions ,each session lasting for 45-60 minutes (two sessions per mother in a week) for 5 weeks.

Session 1

Rapport was developed between parent and therapist .Information regarding child's demographic data , problems faced by parents in handling children in various contexts were discussed.

Session 2

Semi structured parent interview questions were asked:

- What are some of the things your child does well?
- What are the areas of concern?
- What are the main goals for the child?
- Let's identify five goals

Session 3

Teaching steps for goal setting using SMART goals

- S- Specific

Who is involved

- What is to be accomplished
- Where is it to be accomplished
- Within what time frame
- What are the requirements and constraints?

- M- Measurable

Frequency, repetitions and when it is accomplished?

- Achievable

Planning a time frame to achieve the goal

- R- Relevant

What the mother believes is possible for the child

- T- Timely

The one which can be experienced, seen , heard or felt

Example of one goal made by a mother:

By the end of 10 therapy sessions her daughter will be able to sit on her lap on the stationery swing in the park for 2 minutes without crying.

Session 4

- Setting collaborative goals between the therapist and the mothers by analysis of task and environment.
- Here the parents selected activity settings (eg., home or community) and then they selected routines of child (eg., self care, leisure).Sensory patterns of child was addressed
- Joint plans are made by therapist and mother for improving child's participation.

Session 5

Awareness of strategies used by the mothers to engage child in activities:

- What do you know about…..?
- What have you tried?
- What happened when you….?

- What supports were most helpful?

Analysis of strategies used by the mothers to engage child in activities:

- How does that compare to what you did before?
- What do you think will happen if you…?
- How is that consistent with your goals?

Alternatives that could have been used:

- What else could you have done?
- What would it take for you to be able to…..?
- What might make it work better next time?

Session 6 & 7

Action by the mothers:

Here the mothers were taught to engage the child in activities by according to each child's sensory issues by using strategies where task and/ or environment were modified:

Examples:

For children with tactile issues:

- Avoid cape, sitting on rocking horse, avoiding scissors during haircut
- Nail cutting- using nail paints or mehendi
- Using gloves for craft activities while using sticky materials

For children with auditory issues:

- Using headphones in crowded areas

For children with visual issues:

- Adjusting lighting at home/restaurants

- Wear sunglasses to avoid bright light
- Finger puppets for finger gazing

For children with proprioceptive issues:

- Carrying shopping bags to reduce hand flapping in shopping areas
- Using chewy tube or crumbling papers to maintain attention during activities

For vestibular issues

- Involving peer group in playground activities
- Making child to sit on mothers lap for swinging

Session 8 & 9

Mothers were asked about the goal performance over the weeks and sharing experiences and knowledge about how they used the strategies. Eg: One mother explained how it was effective when she made the child sit in a tub of water during haircut. The child cooperated better with less tantrums.

Session 10

- Verifying and discussing about the goals achieved by administering scales (COPM, GAS,PSOC, HCAS)
- Setting up new goals and helping mothers experience competence.

DATA ANALYSIS AND RESULTS

The study was conducted in 30 children with ASD within the age group of 2 to 15years. The study group was divided into two groups the experimental group and the control group, with 15 children in each group. The experimental group received contextual intervention and regular occupational therapy and the control group received only regular occupational therapy

The scores of experimental and control group were subjected to statistical analysis using IBM® SPSS software Version 20

- **Wilcoxon** was used for the within group comparison
  Comparison of pre test - post test scores of experimental group and control group
- **Mann-whitney** was used for the comparison between experimental and control groups
- **Repeted measures ANOVA** was used was used for assessing their effect size.

RESULTS

Table 1: Participant characteristics (children)

Group	N	Gender (N)		Age		Gender	
		male	female	mean	SD	mean	SD
Experimental	15	12	3	5.73	2.93	1.20	0.41
Control	15	10	5	2.0	0.00	4.06	1.03

The above table shows that the mean age of experimental group is 5.73 ±2.93 and 2 ±0.00 for the control group respectively. The mean of gender in experimental group is 1.20 ± 0.41and 4.06 ±1.03 for the control group.

Table 2a: Participant characteristics (mothers)

	Experimental	Control
Urban	11	6
Rural	4	9
UG	10	9
PG	1	0
Below 12th	4	6

The above table shows the demographic details of mothers participating in the study

Table 2b: Mean age of mothers

Group	N	Mother age	
		Mean	SD
Experimental	15	32.06	4.63
Control	15	30.00	2.87

This table shows that the mean age of experimental group is 32.06 ±4.63 and 30 and 4.63± 2.87 for the control group.

Table 3: Intervention characteristics:

Activity settings	Experimental (in %)	Control (in %)
Home	86.6	80
Community	73.3	86.6
Self care	100	93.3
Leisure	66.6	60

The above table shows the bulk of activity settings chosen by the mothers

Table 4: Short sensory profile patterns

Components	Experimental (%)	Control (%)
Tactile sensitivity	93.3	100
Taste/smell sensitivity	80	86.6
Movement sensitivity	80	40
Seeks sensation	86.6	80
Auditory filtering	100	80
Low energy/weak	13.3	13.3
Visual/auditory sensitivity	93.3	80

The above table shows the percentage of sensory patterns in children according to the short sensory profile.

Table 5a: Frequency of overall participation on HCAS for the experimental group children

		Frequency of participation			
Time period		Never	Monthly	Weekly	Daily
Pretest	T1	815	283	66	89
	T2	815	283	66	89
	T1+T2	1630	566	132	178
Post test	T3	394	510	162	147
	T4	394	510	162	147
	T3+T4	788	1020	324	294

The above table shows the overall frequency of activity participation of children in experimental group during T1,T2,T3 and T4.

Table 5b: Frequency of participation on HCAS for the control group children

		Frequency of participation			
Time period		Never	Monthly	Weekly	Daily
Pre	T1	699	323	113	106
	T2	699	323	113	106
	T1+T2	1398	646	226	212
Post	T3	613	370	126	114
	T4	613	370	126	114
	T3+T4	1226	740	252	228

The above table shows the overall frequency of activity participation of children in control group during T1,T2,T3 and T4.

Children's participation

Table 6a: COPM performance and satisfaction pretest scores for the experimental and control group

Test	COPM	Group	Mean rank	U score	Sig 2tailed
Pretest	Performance T1	Experimental	14.27	94	0.441
		Control	16.73		
	Satisfaction T1	Experimental	12.63	11	0.074
		Control	18.37		
	Performance T2	Experimental	14.47	97	0.519
		Control	16.53		
	Satisfaction T2	Experimental	13.27	79	0.164
		Control	17.73		

Table 6a and graph 6a shows the pretest scores of performance and satisfaction components on COPM during the baseline T1 and T2 which shows that there is no significant difference between the pretest scores.

Graph 6a

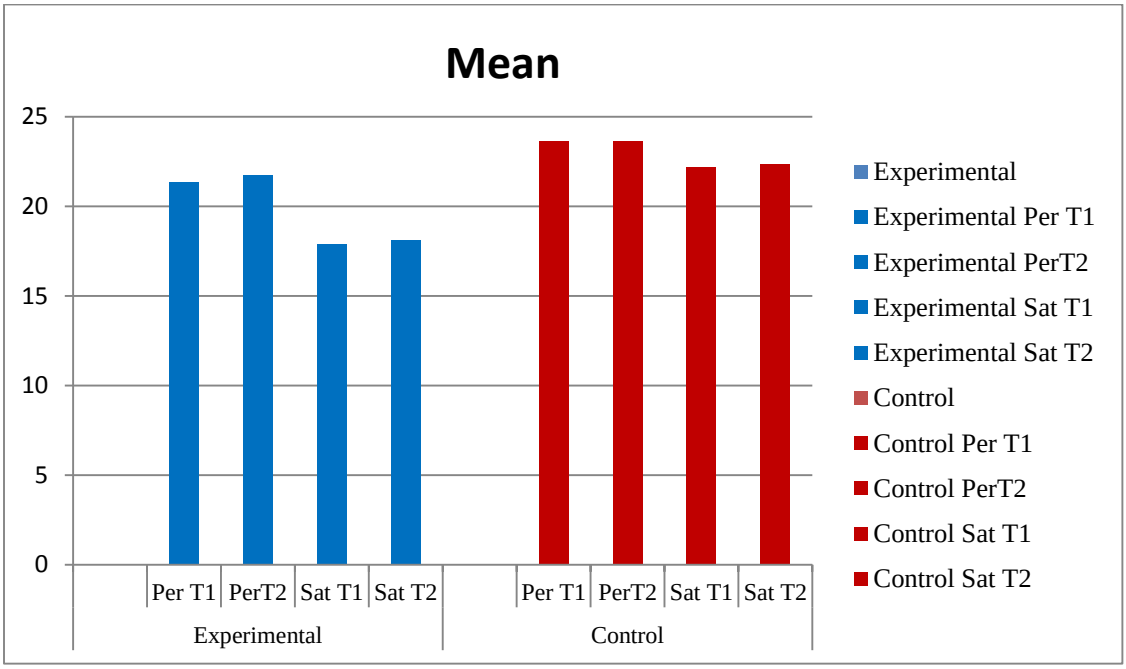

Mean
25
20
15
10
5
0
Per T1
PerT2
Sat T1
Sat T2
Per T1
PerT2
Sat T1
Sat T2
Experimental
Control
Experimental
Experimental Per T1
Experimental PerT2
Experimental Sat T1
Experimental Sat T2
Control
Control Per T1
Control PerT2
Control Sat T1
Control Sat T2

Table 6b: GAS pretest scores for the experimental and control group

Test	GAS	Group	Mean rank	U score	Sig 2 tailed
Pretest	T1	Experimental	16.20	102	0.574
		Control	14.80		
	T2	Experimental	18.10	73.5	0.066
		Control	12.9		

Table 6b and graph 6b shows the pretest scores of GAS during baseline T1 and T2 which shows that there is no significant difference between the pretest scores.

Graph 6b:

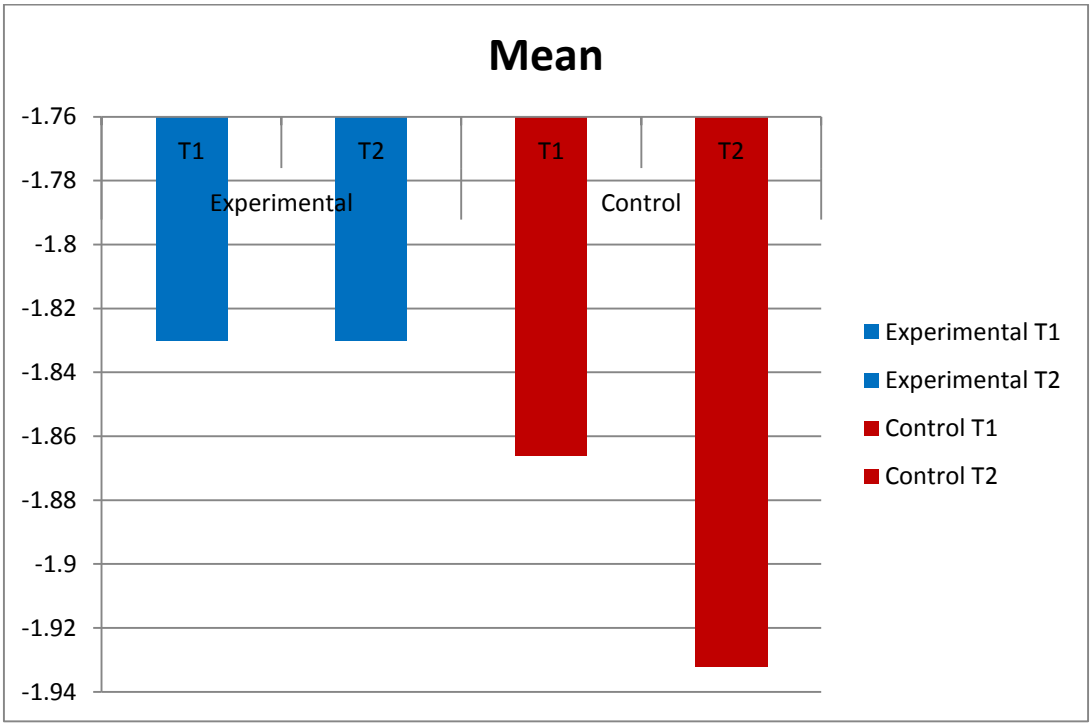

Mean
-1.76
-1.78
-1.8
-1.82
-1.84
-1.86
-1.88
-1.9
-1.92
-1.94
T1
T2
T1
T2
Experimental
Control
Experimental T1
Experimental T2
Control T1
Control T2

Table 6c: PSOC efficacy and satisfaction pretest scores for the experimental and control group

Test	PSOC	Group	Mean rank	U score	Standard deviation
Pretest	Efficacy T1	Experimental	15.87	107	0.819
		Control	15.13		
	Satisfaction T1	Experimental	11.30	49.5	0.009
		Control	19.70		
	Efficacy T2	Experimental	15.87	107	0.819
		Control	15.13		
	Satisfaction T2	Experimental	11.33	50	0.009
		Control	19.67		

Table 6c and graph 6c shows the pretest scores of efficacy and satisfaction components of PSOC during the baseline T1and T2 which shows that there is no significant difference between the pretest scores.

Graph 6c

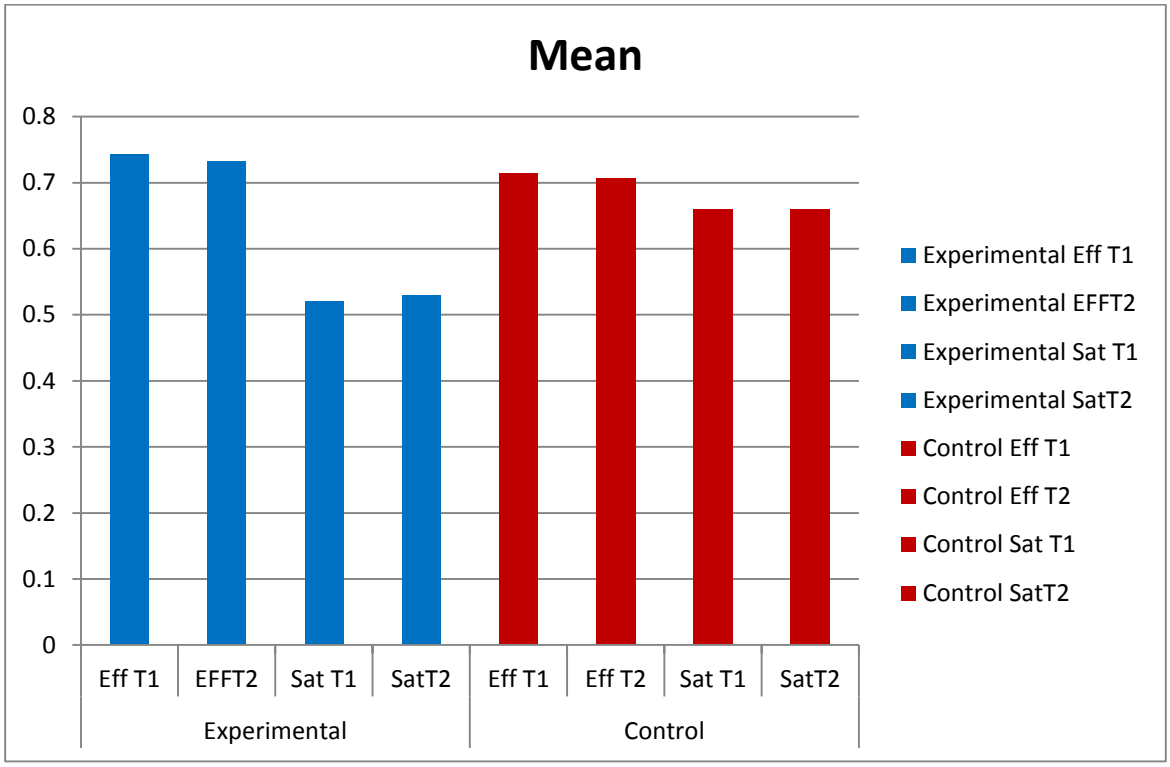

Mean
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Eff T1
EFFT2
Sat T1
SatT2
Eff T1
Eff T2
Sat T1
SatT2
Experimental
Control
Experimental Eff T1
Experimental EFFT2
Experimental Sat T1
Experimental SatT2
Control Eff T1
Control Eff T2
Control Sat T1
Control SatT2

Table 6d: SSP pretest scores of experimental and control groups

Test	Outcome measure	group	N	mean	Standard deviation	U score	Sig(2tailed)
T1	Auditory filtering	control	15	8.90	7.52	88.0	0.11
		experimental	15	8.90	7.52		
	Movement sensitivity	control	15	11.40	4.10	75.0	0.10
		experimental	15	11.40	4.10		
	Tactile sensitivity	control	15	12.83	7.3	106.50	0.80
		experimental	15	12.83	7.3		
	Under responsive /seeks sensation	control	15	16.93	8.15	112.0	0.98
		experimental	15	16.93	8.15		
	Taste/smell sensitivity	control	15	6.63	5.10	98.0	0.43
		experimental	15	6.63	5.10		
	Low energy/weak	control	15	29.30	1.87	96.0	0.24
		experimental	15	29.30	1.87		
	Visual/auditory sensitivity	control	15	9.73	5.9	109	0.88
		experimental	15	9.73	5.9		
	total	control	15	94.63	23.7	105.5	0.77
		experimental	15	94.63	23.7		

T2	Auditory filtering	Control	15	8.90	7.52	88.0	0.11
		experimental	15	8.90	7.52		
	Movement sensitivity	Control	15	11.40	4.10	75.0	0.10
		experimental	15	11.40	4.10		
	Tactile sensitivity	Control	15	12.83	7.3	106.50	0.80
		experimental	15	12.83	7.3		
	Underresponsive/ seeksensation	Control	15	16.93	8.15	112.0	0.98
		experimental	15	16.93	8.15		
	Taste/smell sensitivity	Control	15	6.63	5.10	98.0	0.43
		experimental	15	6.63	5.10		
	Low energy/weak	Control	15	29.30	1.87	96.0	0.24
		experimental	15	29.30	1.87		
	Visual/auditory sensitivity	Control	15	9.73	5.9	109	0.88
		experimental	15	9.73	5.9		
	Total	Control	15	94.63	23.7	105.5	0.77
		experimental	15	94.63	23.7		

Table 6d and graph 6d shows the pretest scores of SSP between the experimental and control group during T1and T2 which shows that there is no significant difference between the pretest scores.

Graph 6d

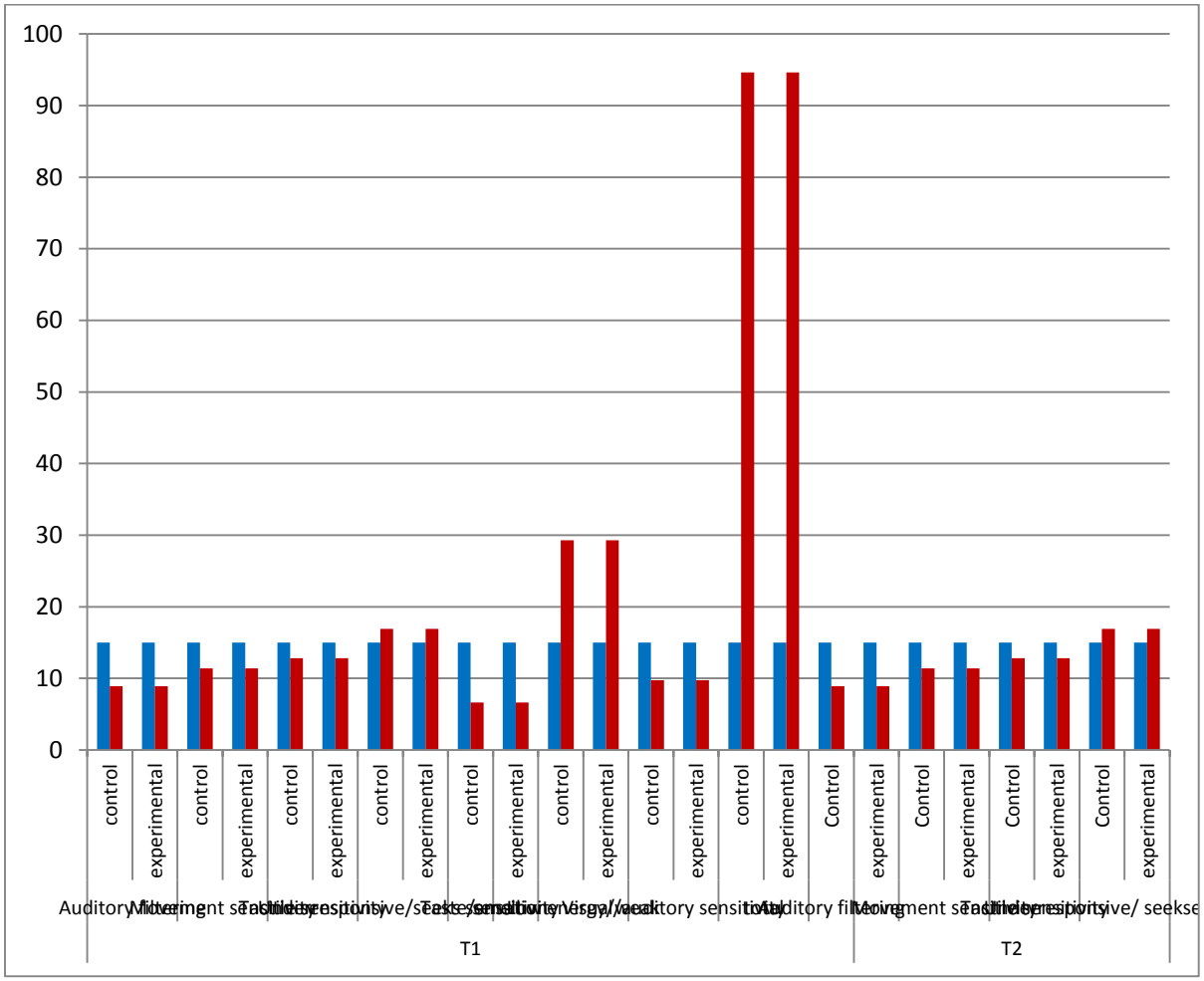


Table 7a: Comparison between the pretest and post test scores of performance and satisfaction components of COPM of experimental and control group

Test	COPM	Group	Mean rank	U score	Sig 2tailed
Pretest	Performance T1	Experimental	14.27	94	0.441
		Control	16.73		
	Performance T2	Experimental	14.47	97	0.519
		Control	16.53		
	Satisfaction T1	Experimental	12.63	69.5	0.074
		Control	18.37		
	Satisfaction T2	Experimental	13.27	79	0.164
		Control	17.73		
Post test	Performance T3	Experimental	22.2	12	**0.000**
		Control	8.80		
	Performance T4	Experimental	22.27	11	**0.000**
		Control	8.73		
	Satisfaction T3	Experimental	20.73	34	**0.001**
		Control	10.27		
	Satisfaction T4	Experimental	20.87	32	**0.001**
		Control	10.13		

Table 7aand graph 7a shows the comparison between the pre test and post test scores of COPM performance and satisfaction components through all time lines from T1 to T4 and shows that significant difference is present during T3 and T4

Graph 7a

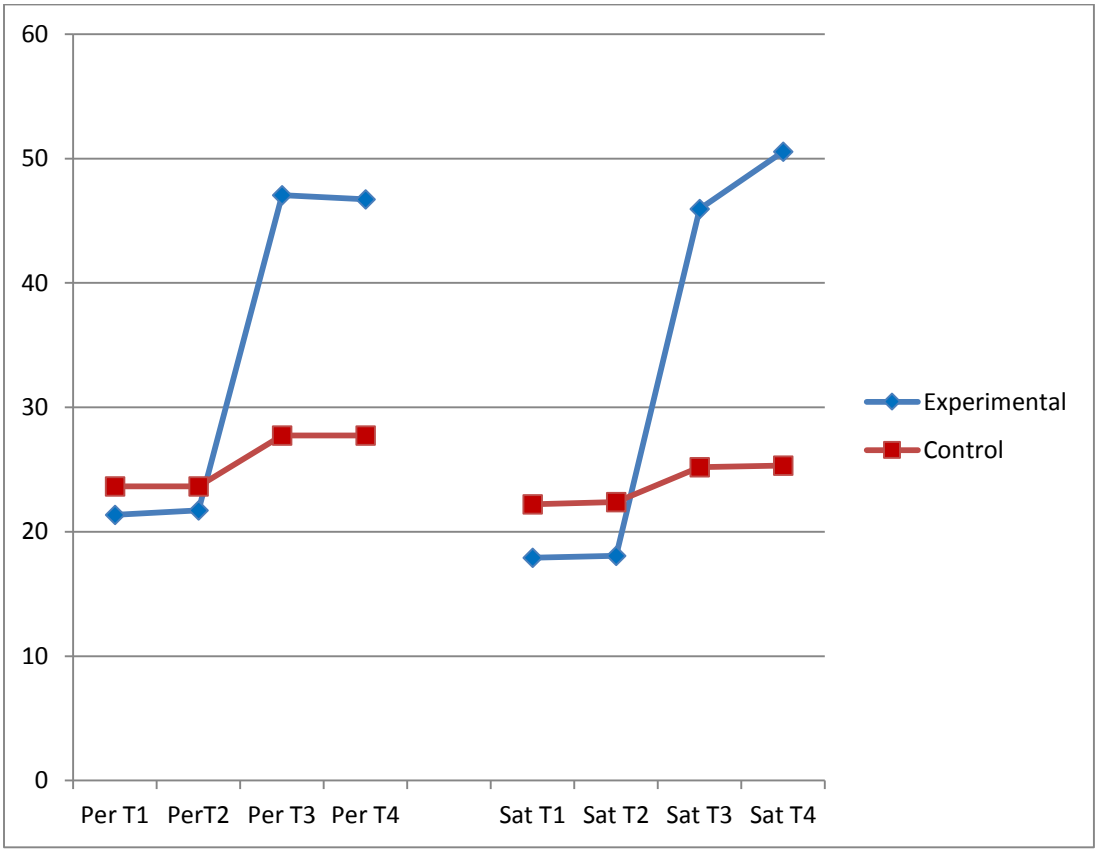

60
50
40
30
20
10
0
Per T1
PerT2
Per T3
Per T4
Sat T1
Sat T2
Sat T3
Sat T4
Experimental
Control

Table 7b: Comparison between the performance component of COPM within the experimental and control groups

COPM components	Test	N	Neg rank	Mean rank	Sum of ranks	Pos rank	Mean rank	Sum of ranks	Ties	Z score	Sig(2tailed)
Performance	T2-T1	30	0	0.00	0.00	2	1.50	3	28	-1.32	0.180
	T3-T2	30	0	0.00	0.00	29	15	435	1	-4.705	**0.000**
	T4-T3	30	2	3.50	7	4	3.50	14	24	-0.742	0.458
	T4-T1	30	0	0.00	0.00	29	15	435	1	-4.705	**0.000**

Table 7b and graph 7b shows that there is no significant difference in the performance scores between T1 and T2 and T3 and T4 ($p > 0.05$) whereas there is statistically significant difference in the performances scores between T2 and T3, T1 and T4 ($p<0.05$)

Graph 7b

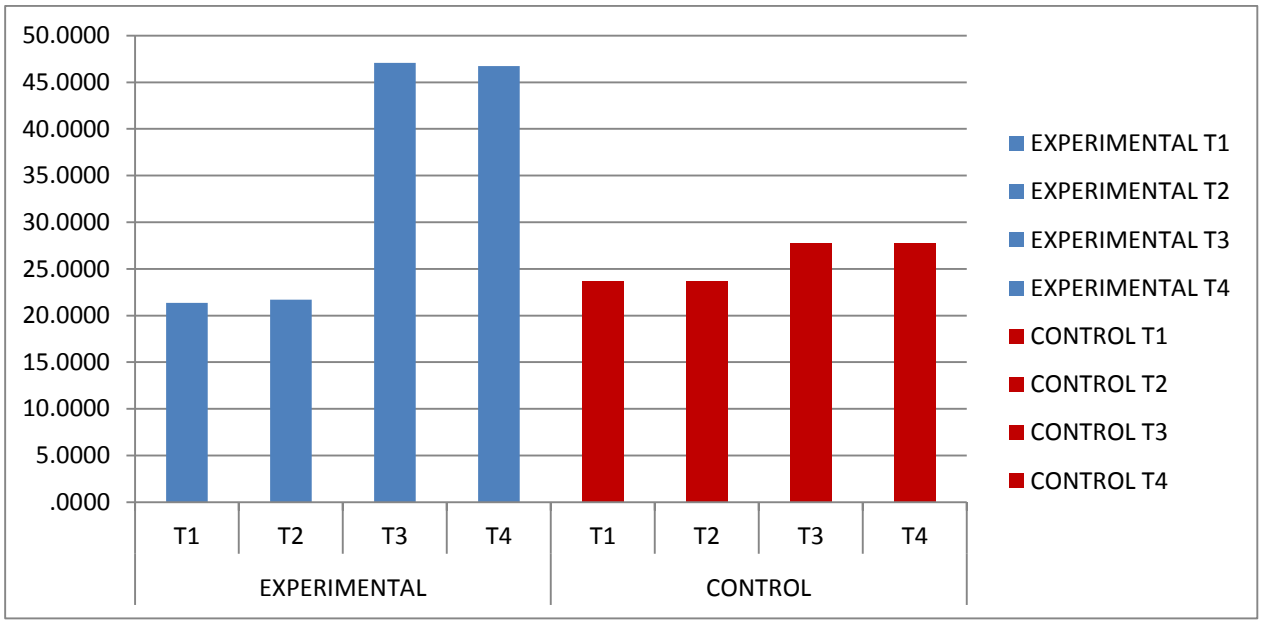

50.0000
45.0000
40.0000
35.0000
30.0000
25.0000
20.0000
15.0000
10.0000
5.0000
.0000
T1
T2
T3
T4
T1
T2
T3
T4
EXPERIMENTAL
CONTROL
EXPERIMENTAL T1
EXPERIMENTAL T2
EXPERIMENTAL T3
EXPERIMENTAL T4
CONTROL T1
CONTROL T2
CONTROL T3
CONTROL T4

Table 7c: Effect size for COPM performance component between the experimental and control group

	F	df	P value	Partial eta squared
Between groups	340.8	1	0.000	0.922
Error		29		

For between the experimental and control group 4 (timeline) by 2 (group) repeated measure ANOVA using COPM performance scores indicated that the experimental group performed significantly better than the control group over the 4 timelines, $F(1,29)=340.8$,$p=0.000$, $\eta p2=0.922$ (very large effect)

Table 7d: Comparison between the satisfaction component of COPM within the experimental and control groups

COPM components	Test	N	Neg rank	Mean rank	Sum of ranks	Pos rank	Mean rank	Sum of ranks	Ties	Z score	Sig (2tailed)
Satisfaction	T2-T1	30	4	5	20	6	5.83	35	20	-0.775	0.439
	T3-T2	30	4	9	36	25	15.96	399	1	-0.392	**0.000**
	T4-T3	30	3	4.67	14	16	11	176	11	-0.326	**0.001**
	T4-T1	30	4	7.75	31	24	15.63	375	2	-3.919	**0.000**

Table 7d and graph 7d shows that there is no significant difference in the satisfaction scores between T1 and T2 ($p > 0.05$) whereas there is statistically significant difference in the performances scores between T2 and T3, T3 and T4, T1 and T4 ($p<0.05$)

Graph 7d

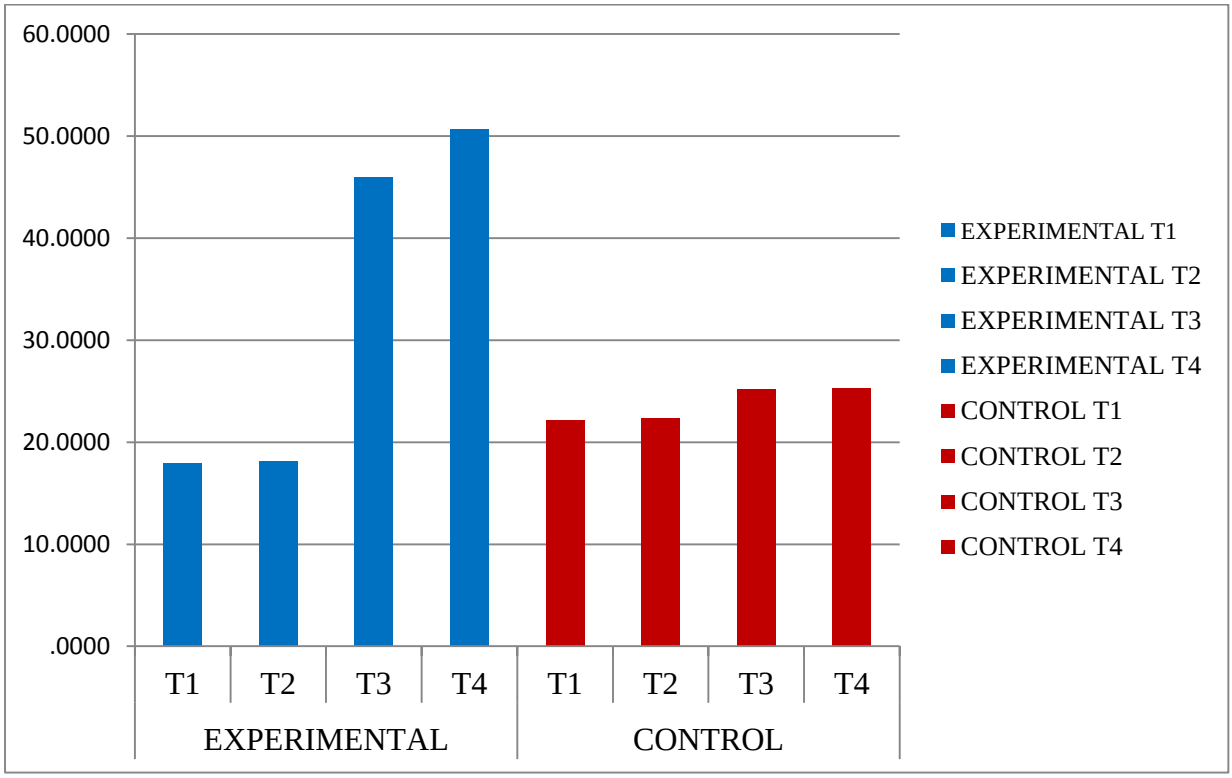

60.0000
50.0000
40.0000
30.0000
20.0000
10.0000
.0000
T1
T2
T3
T4
T1
T2
T3
T4
EXPERIMENTAL
CONTROL
EXPERIMENTAL T1
EXPERIMENTAL T2
EXPERIMENTAL T3
EXPERIMENTAL T4
CONTROL T1
CONTROL T2
CONTROL T3
CONTROL T4

TABLE 7e : Effect size for COPM satisfaction component between the experimental and control group

	F	**df**	**P value**	**Partial eta squared**
Between groups	314.977	1	0.000	0.916
Error		29		

For between the experimental and control group 4(timeline) by 2 (group) repeated measure ANOVA using COPM satisfaction scores indicated that the experimental group performed significantly better than the control group over the 4 timelines, $F(1,29)=314.97$,$p=0.000$, $\eta p2=0.916$ (very large effect)

Table 8a: Comparison between the pretest and post test scores of GAS of experimental and control group

Test	GAS	Group	Mean rank	U score	Sig 2tailed
Pretest	T1	Experimental	16.20	102	0.574
		Control	14.80		
	T2	Experimental	18.10	73.5	0.066
		Control	12.9		
Post test	T3	Experimental	22.97	0.500	**0.000**
		Control	8.03		
	T4	Experimental	23	0.000	**0.000**
		Control	8		

Table 8a and graph 8a shows that there is no significant difference in the GAS scores of experimental and control group during T2 ($p>0.05$) whereas there is statistically significant difference in scores during T3 ($p<0.05$).

Graph 8a

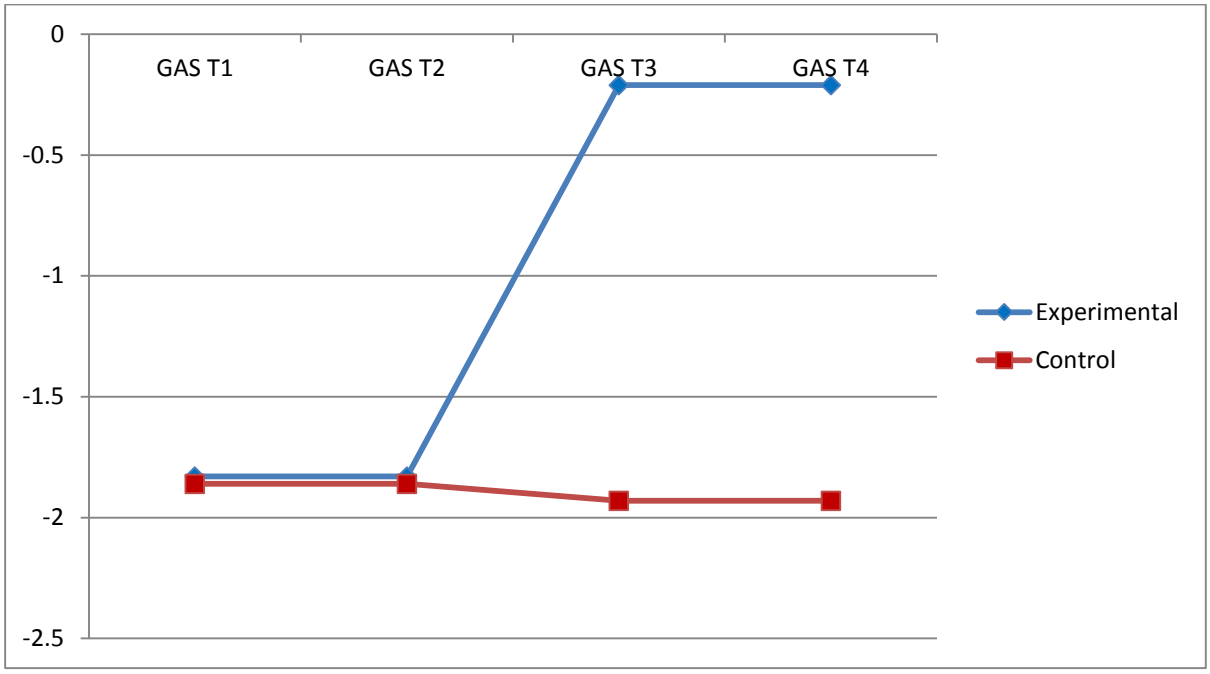
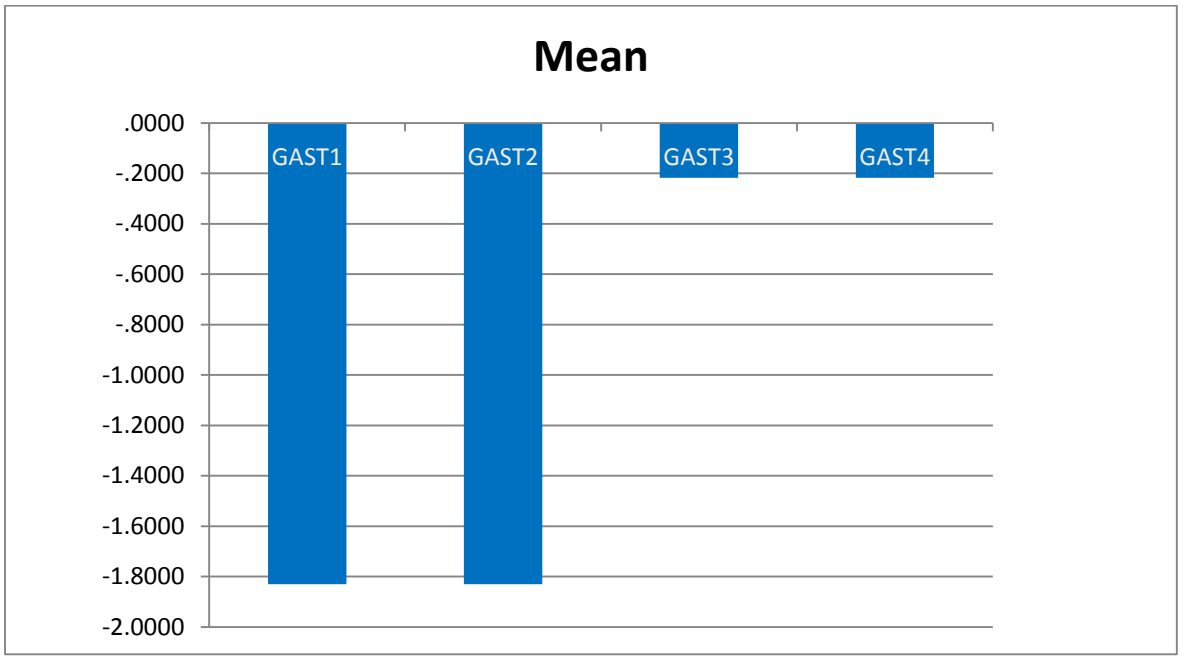


Table 8b: Comparison of GAS scores within the experimental and control groups

Test	N	Neg rank	Mean rank	Sum of ranks	Pos rank	Mean rank	Sum of ranks	Ties	Z score	Sig(2tailed)
T2-T1	30	1	1	1	5	4	20	24	-2.003	0.45
T3-T2	30	3	5.50	16.50	18	11.92	214.50	9	-3.448	**0.001**
T4-T3	30	1	3.50	3.50	13	7.81	101.50	16	-3.106	**0.002**
T4-T1	30	3	5.50	16.50	19	12.45	236.50	8	-3.578	**0.000**

Table 8b and graph 8b shows that there is no significant difference in the GAS scores between T1 and T2 ($p > 0.05$) whereas there is significant difference in the GAS scores between T2 and T3, T3 and T4, T1 and T4 ($p < 0.05$)

Graph 8b (experimental group)



Graph 8b (control group)

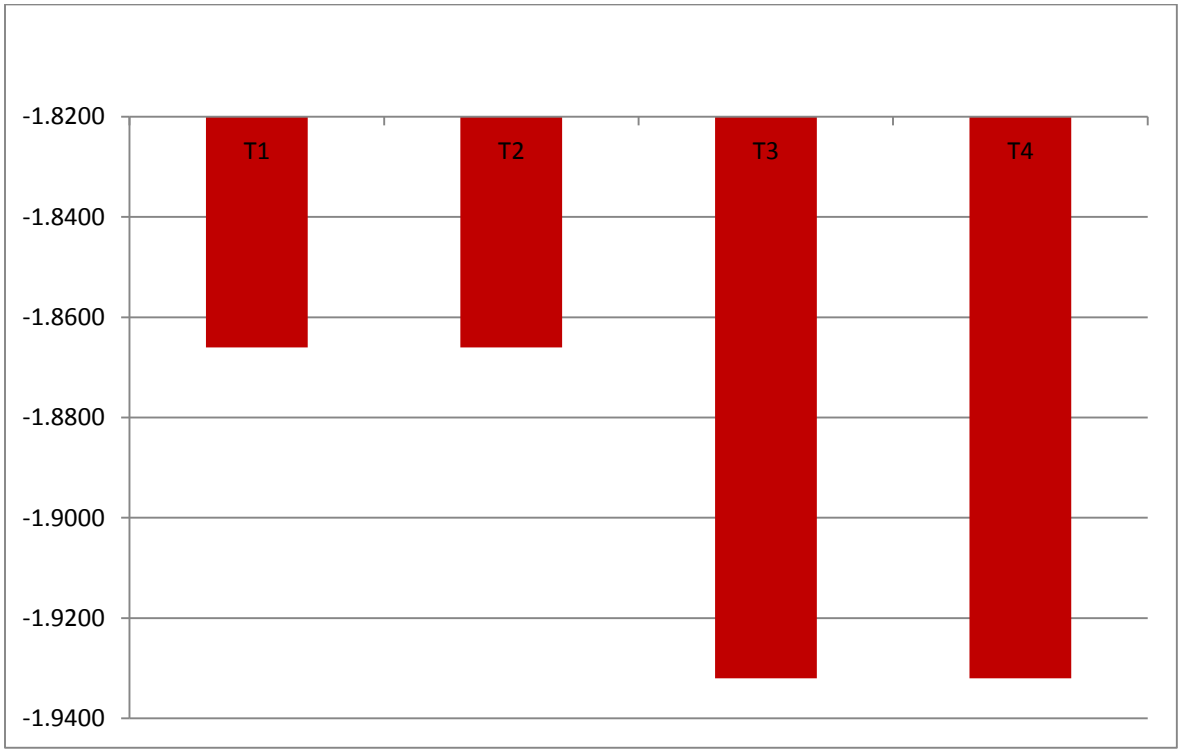


Table 8c: Effect size of GAS between experimental and control groups

	F	**df**	**P value**	**Partial eta squared**
Between groups	252.053	1	0.000	0.897
Error		29		

For between the experimental and control group 4 (timeline) by 2 (group) repeated measure ANOVA using GAS scores indicated that the experimental group performed significantly better than the control group over the 4 timelines, $F(1,29)=252.05$,$p=0.000$, $\eta p2=0.897$ (very large effect) .

Table 9a:Frequency of activity participation across various areas on the HCAS (experimental group)

	Never				Monthly				Weekly				Daily			
Cate-gories	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
A	32	32	4	4	40	40	28	28	3	3	29	29	0	0	4	4
B	119	119	49	49	3	3	13	13	0	0	0	0	8	8	8	8
C	106	106	34	34	26	26	60	60	24	24	24	24	24	24	65	65
D	161	161	63	63	130	130	170	170	19	19	45	45	12	12	31	31
E	171	171	92	92	54	54	102	102	22	22	40	40	28	28	33	33
F	26	26	6	6	29	29	24	24	2	2	9	9	3	3	7	7
G	15	15	37	37	13	13	39	39	2	2	7	7	0	0	0	0
H	19	19	7	7	26	26	43	43	0	0	1	1	0	0	0	0
I	54	54	54	54	0	0	2	2	0	0	0	0	0	0	0	0

A:Routine errands, B:School activities, C:Parent child activities, D:Outdoor activities, E:Leisure, F:Faith based activities, G:Neighbourhood activities, H:Community activities & I:Sports

The table shows that frequency of participation has increased from never to monthly, weekly and daily for all areas except sports.

Table 9b:Frequency of activity participation across various areas on the HCAS (control group)

	Never				Monthly				Weekly				Daily			
Cate-gories	T1	T2	T3	T4	T1	T2	T3	T4	TI	T2	T3	T4	T1	T2	T3	T4
A	33	33	12	12	27	27	34	34	5	5	15	15	0	0	0	0
B	112	112	112	112	11	11	12	12	0	0	0	0	12	12	11	11
C	93	93	76	76	30	30	43	43	23	23	26	26	34	34	35	35
D	138	138	129	129	84	84	129	129	23	23	114	114	25	25	28	28
E	146	146	130	130	49	49	62	62	34	34	46	46	32	32	36	36
F	12	12	6	6	30	30	31	31	0	0	2	2	0	0	3	3
G	77	77	77	77	52	52	52	52	6	6	6	6	0	0	0	0
H	12	12	13	13	36	36	30	30	3	3	0	0	0	0	0	0
I	64	64	64	64	0	0	0	0	0	0	0	0	0	0	0	0

A:Routine errands, B:School activities, C:Parent child activities, D:Outdoor activities, E:Leisure, F:Faith based activities, G:Neighbourhood activities, H:Community activities & I:Sports

The table shows that frequency of participation has increased from never to monthly, weekly and daily for all areas except sports.

Table 10 a**:** Comparison between the pretest and post test scores of efficacy and satisfaction components of PSOC of experimental and control group

Test	PSOC	Group	Mean rank	U score	Sig 2tailed
Pretest	Efficacy T1	Experimental	15.87	107	0.819
		Control	15.13		
	Eff icacy T2	Experimental	15.87	107	0.819
		Control	15.13		
	Satisfaction T1	Experimental	11.30	49.50	0.009
		Control	19.70		
	Satisfaction T2	Experimental	11.33	50	0.009
		Control	19.67		
Post test	Efficacy T3	Experimental	17.03	89.5	0.338
		Control	13.97		
	Eff icacy T4	Experimental	17.03	89.5	0.338
		Control	13.97		
	Satisfaction T3	Experimental	13.73	86	0.268
		Control	17.27		
	Satisfaction T4	Experimental	13.93	89	0.324
		Control	17.07		

Table 10a and graph 10 a shows that there is no significant difference in the efficacy and satisfaction scores of PSOC of experimental and control group throughout all timelines.

Graph 10 a:

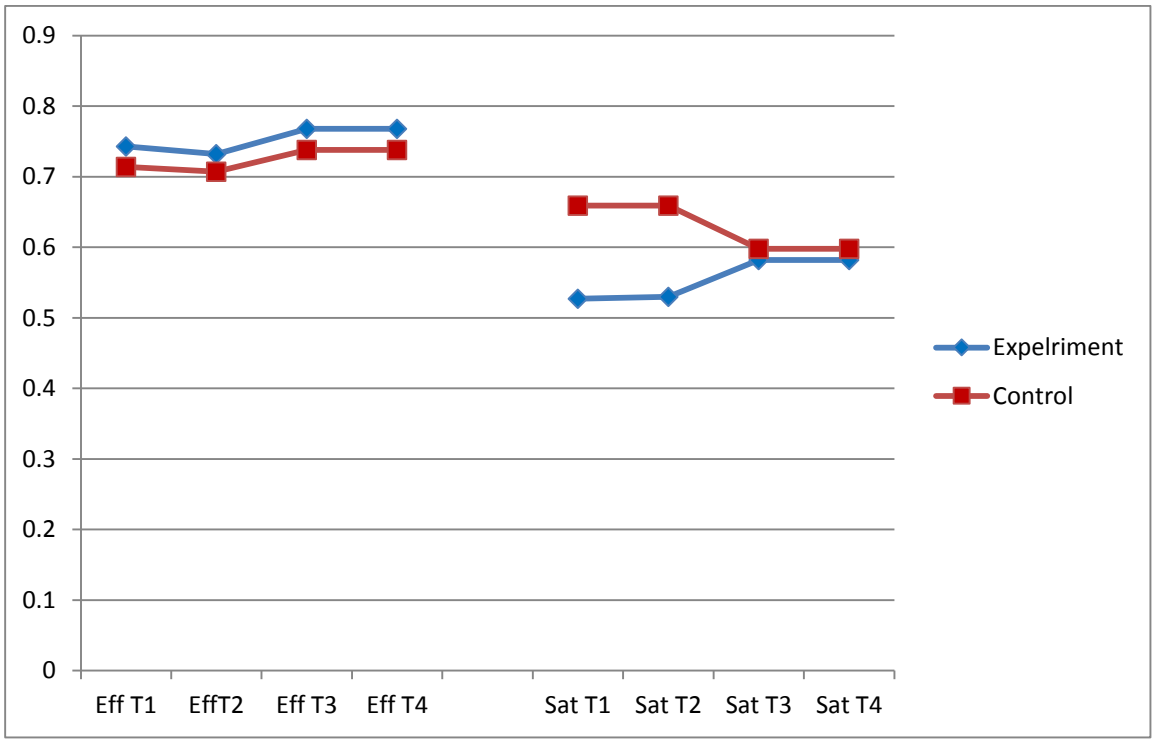

0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Eff T1
EffT2
Eff T3
Eff T4
Sat T1
Sat T2
Sat T3
Sat T4
Expelriment
Control

Table 10b: Comparison between the efficacy component of PSOC within the experimental and control groups

PSOC components	Test	N	Neg rank	Mean rank	Sum of ranks	Pos rank	Mean rank	Sum of ranks	Ties	Z score	Sig(2tailed)
Eff-icacy	T2-T1	30	2	1.50	3	0	0.00	0.00	28	-1.3	0.180
	T3-T2	30	6	13.75	82.5	17	11.38	193.5	7	-1.7	0.091
	T4-T3	30	0	0.00	0.00	0	0.00	0.00	30	0.0	1
	T4-T1	30	7	15.21	106.5	17	11.38	193.5	6	-1.2	0.213

Table 10 b and graph 10 b shows that there is no significant difference in the efficiency component of PSOC between T1 and T2, T2 and T3, T3 and T4, T1 and T4 ($p>0.05$)

Graph 10 b

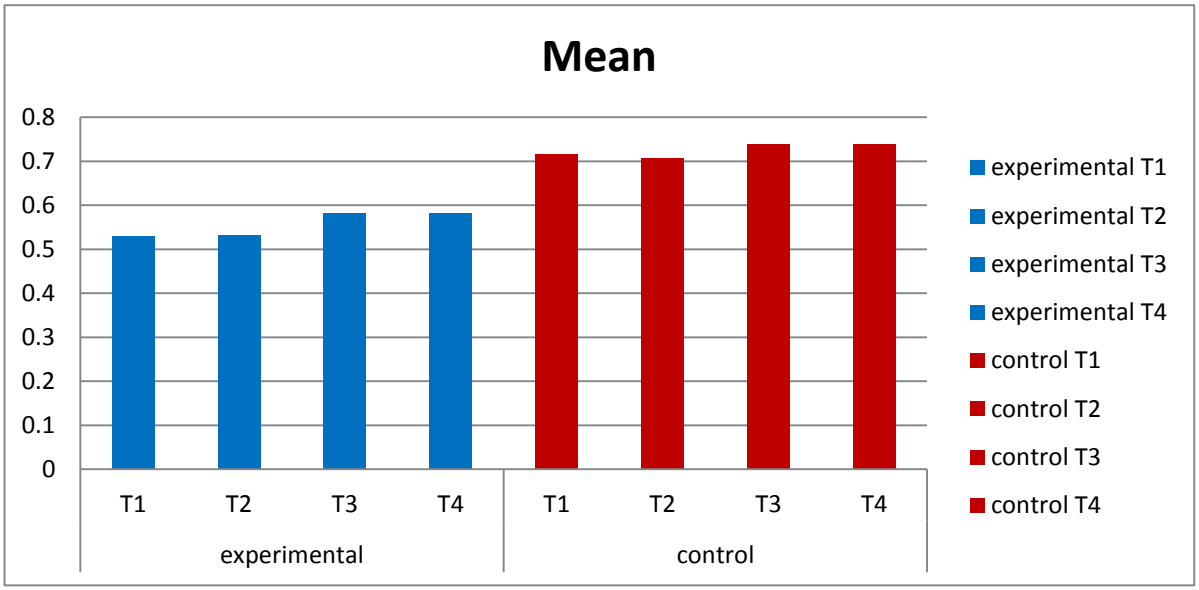

Mean
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
T1
T2
T3
T4
T1
T2
T3
T4
experimental
control
experimental T1
experimental T2
experimental T3
experimental T4
control T1
control T2
control T3
control T4

Table 10c : Effect size of efficacy component of PSOC between experimental and control groups

	F	df	P value	Partial eta squared
Between groups	687.956	1	0.00	0.960
Error		29		

For between the experimental and control group 4(timeline) by 2 (group) repeated measure ANOVA using PSOC efficacy scores indicated that the experimental group performed significantly better than the control group over the 4 timelines, $F(1,29)=687.9$,$p=0.000$, $\eta p2=0.960$ (very large effect) .

Table 10d : Comparison between the satisfaction component of PSOC within the experimental and control groups

PSOC Components	Test	N	Neg rank	Mean rank	Sum of ranks	Pos-rank	Mean rank	Sum of ranks	Ties	Z score	Sig (2tailed)
Satisfaction	T2-T1	30	0	0.00	0.00	1	1	1	29	-1	0.317
	T3-T2	30	8	17.38	139	15	9.13	137	7	-0.30	0.976
	T4-T3	30	0	0.00	0.00	1	1	1	29	-1	0.317
	T4-T1	30	8	17.19	138	15	9.23	139	7	-0.01	0.988

Table 10d and graph 10 d shows that there is no significant difference in the satisfaction component of PSOC between T1 and T2, T2 and T3, T3 and T4, T1 and T4 ($p>0.05$)

Graph 10 d

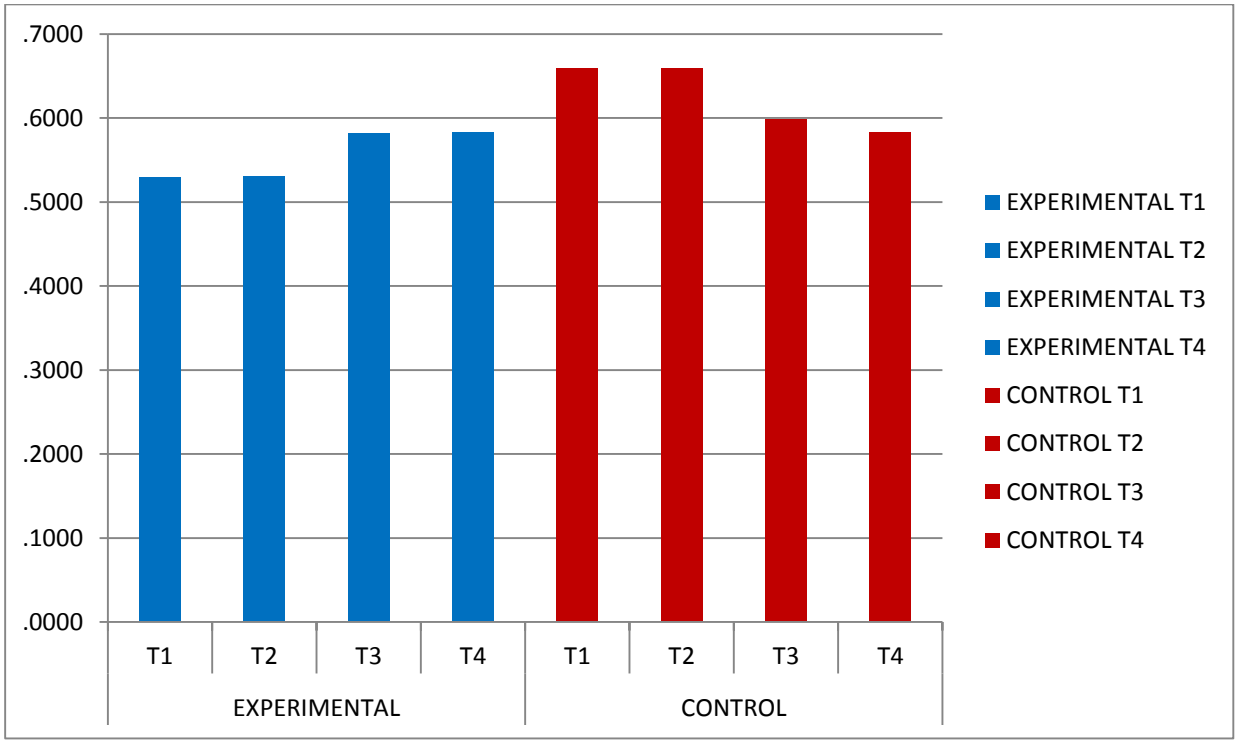

.7000
.6000
.5000
.4000
.3000
.2000
.1000
.0000
T1
T2
T3
T4
T1
T2
T3
T4
EXPERIMENTAL
CONTROL
EXPERIMENTAL T1
EXPERIMENTAL T2
EXPERIMENTAL T3
EXPERIMENTAL T4
CONTROL T1
CONTROL T2
CONTROL T3
CONTROL T4

Table 10e : Effect size for PSOC satisfaction component between the experimental and control group

	F	df	P value	Partial eta squared
Between groups	862.414	1	0.000	0.969
Error		28		

For between the experimental and control group 4(timeline) by 2 (group) repeated measure ANOVA using PSOC satisfaction scores indicated that the experimental group performed significantly better than the control group over the 4 timelines, $F(1,28)=862.4$,$p=0.000$, $\eta p2=0.969$ (very large effect).

DISCUSSION

Interventions for children with autism to improve their activity participation has not been studied vastly and there are limited literatures related to it . Studies have explored the extent to which children participate but not on facilitating it. This study involved mothers of 30 children with ASD out of which 22 were boys and 8 were girls. The mean age of experimental group was **5.73±2.93** and that of control group was **2 ±0.00** (table 1).

Mothers who participated for the study had a mean age of 32± 4.63 and 30±2.87 experimental and control group. Eleven of the mothers in the experimental group were from an urban and 4 from rural community, with an educational status of UG(10 mothers),PG (1 mother), and below 12^{th} standard of education(4 mothers) . Whereas in the control group there were 6 mothers from urban ,9 from rural community. The control group mothers had an educational level of UG(9 mothers) no PG education and 6 had a below 12^{th} standard level of education

On comparing the pretest scores of COPM, GAS, PSOC, SSP and HCAS on baseline were not statistically significant showing that both the groups were homogenous in characteristics and could be considered for further statistical analysis. (Tables 6 a,6b,6c,6d,5a,5b).

Sensory Profile patterns

Children with ASD present with difficulty processing and integrating sensory information (**Baranek et al.,2006 and Mallioux et al., 2010**) which has an impact on their participation in daily activities (**Schaaf et al, 2012**). This reflects the results shown in Short sensory profile scores (table 4)wherein the sensory patterns are tactile sensitivity(93.3%), taste/smell sensitivity (80%),movement sensitivity(80%), seeks sensation(86.6%), auditory filtering(100%), low energy (13.3%) and visual/auditory sensitivity (93.3%) for experimental group and 100%, 86.6%, 40%, 80%,80%, 13.3% and 80% respectively for control group .A study by **Smith Roley et al.'s (2015)** has demonstrated a link between problems in sensory integration and social participation. Mothers were

interested in goals that would improve their child's ability to participate in ADLs, play, and rest and sleep. These sensory issues hindered the meaningful participation of children involved in this study.

Intervention characteristics:

The bulk of activity settings chosen by the mothers were the home, community wherein home (83%), community (73.3%), self care (100%) and leisure (66.6%) for the experimental group and 80%, 86.6%, 93.3% and 60% for control group respectively. Mothers discussed about goals for their children and identified strategies along with the therapist to achieve the goals .The strategies used in this study were embedded within the child's activity settings and daily routines thus mothers gave a positive feedback about the increase in participation of their children in various activities like routine errands, school activities, outdoor and community activities, parent and child activities, sports and leisure activities on the Home and Community Activity Scale (table 9a and 9b**).** Here the frequency of participation increased from never to monthly, weekly and daily. This finding is congruent with the results of the study by **Winnie Dunn (2012**) wherein she stated that when intervention is given in authentic activity settings, it improves participation.

Children's participation

There was a significant($p \leq 0.05$) improvement in children's performance and participation (COPM ,GAS and HCAS) shown in table 7a, graph 7a and table 8a, graph 8a, table 9a and 9b. Mothers exhibited positive perceptions of their children's participation through the sustainability period, suggesting that they discovered successful methods for managing their daily lives (table 10a and graph 10a). Mothers set 90 goals (mean=3 goals). They did not change the goals or discontinue any goals till the end of the 12 weeks .

The performance and satisfaction scores on COPM improved significantly ($p \leq 0.05$) during intervention phase (T2 to T3) and from beginning to end of the study (T1 to T4).

There was less changes in the initial waiting period (T1 to T2). This result is similar to the results of the study by **Winnie Dunn, 2012** wherein she found that the COPM performance and satisfaction scorings had significantly improved following contextual intervention at the same timelines as our study..These results also show that when mothers were involved in choosing activities for their children there was more adherence to therapy plans (**Mary Law 2006**).

It is evident in this study that changes brought in task and environment, increased children's participation (table 8a and graph 8b) which shows statistically significant($p \leq 0.05$) attainment of goals (GAS) set by mothers and therapists together. Similar results are seen in the study by **Winnie Dunn 2012** where there was an improvement in goal attainment on GAS scale. The sores significantly improved from T2 to T3, T3 to T4 and T1 to T4 ($p \leq 0.05$).

The parent sense of competence:

PSOC efficacy scale assesses capability and problem solving ability (e.g., "If anyone can find the answer to what is troubling my child, I am the one"). The efficacy components of PSOC did not show a statistically significant ($p \geq 0.05$) improvement (table 10b) at all timelines as the mothers wanted more time to experience competence and to evaluate their child's progress in performance. These data suggest that mothers need time to process their child's progress, contextual factors, and their own reactions to their child's behavior. The Satisfaction scale reflects parental emotions **(Rogers & Matthews, 2004**); mothers' scores indicated that they had relatively low levels of frustration and anxiety about parenting throughout the study period with no significant changes during the intervention period.

The current study demonstrated a very large effect size in performance component ($\eta p2=0.922$) and in the satisfaction component ($\eta p2=0.916$) on the COPM , GAS ($\eta p2 =0.897$), on the efficacy component ($\eta p2=0.960$) and on the satisfaction component ($\eta p2=0.969$) of PSOC for the experimental group . This means that the contextual intervention was effective for the children with autism for activity participation and

parents felt competent in setting and achieving appropriate context based goals for their children . Contextual intervention emphasizes changing the parameters of the task or environment rather than a focus on remediation of a child's abilities. The assumption of this approach is that changes to the task and/or environment will enable the child to perform an activity that they were unable to do previously.(**Johanna Darrah et al., 2011).**

Thus the summary of the findings of the present study are that there was a significant improvement in the performance and satisfaction of the children's participation, and goal achievement .The parent satisfaction and efficacy also improved when they were involved in the goal setting for their children .

CONCLUSION

This study concludes that by providing a structure for problem solving (intervention characteristics) and reflective guidance (coaching), the mothers found unique ways to achieve their goals. Contextual intervention lead to significant improvement in children's participation in ways that parents found useful. Partnering with parents to find strategies to achieve their goals leads to the parents feeling more competent in their parenting role.

LIMITATIONS

- Small sample size
- The participants were a convenience sample that was recruited from a limited section of the society
- Short duration of study

RECOMMENDATIONS

- Demonstrating strategies using videos.
- Using a standardized scale for measuring activity participation.

REFERENCES

- A. Krasny-Pacini et al.,(2013). Goal Attainment Scaling in rehabilitation: A literature-based update. Annals of Physical and Rehabilitation Medicine 56 , 212–230
- Atara Engel (2011). Physical Activity Participation in Children with Autism Spectrum Disorders: An Exploratory Study. A thesis submitted in conformity with the requirements for the degree of Master of Science.
- Bagby, M., et al.,(2012). How sensory experiences in children with and without autism affect family occupations. American Journal of Occupational Therapy, 66, 78–86.
- Carl J. Dunst et al.,(2014) Family Capacity-Building in Early Childhood Intervention: Do Context and Setting Matter. School Community Journal, Vol. 24, No. 1
- Carl J. Dunst, (2002) Family-Centered Practices: Birth Through High School. The Journal Of Special Education Vol. 36/No. 3/ 139–147
- Carl J. Dunst, et al., (2006).Influences of Contrasting Natural Learning Environment Experiences on Child, Parent and Family Well-Being. Journal of Developmental and Physical Disabilities, Vol. 18, No. 3
- Divya Sood et al., (2014) Influence of Home Environment on Participation in Home Activities of Children with an Autism Spectrum Disorder. The Open Journal of Occupational Therapy, Volume 2 , Issue 3
- Dunn, W., et al., (2012). Impact of a contextual intervention on child participation and parent competence among children with autism spectrum disorders: A pretest–posttest repeated-measures design. American Journal of Occupational Therapy, 66, 520–528

- Dunst, C. J.,et al., (2006). Everyday activity settings, natural learning environments, and early intervention practices. Journal of Policy and Practice in Intellectual Disabilities, 3, 3–10.
- Erin Engstrom et al.,: A study on embedding social reinforcers into lunchtime activities in children with autism spectrum disorders. University of California, Santa Barbara
- Heather Vining (2011). A study on increasing participation in the classroom for children with autism spectrum disorders. A thesis presented to the faculty of Bucknell university in partial fulfillment of the requirements for the degree of master of science in education
- Hilton, C. L.,etal.,.(2008). Out-of-school participation patterns in children with high-functioning autism spectrum disorders. American Journal of Occupational Therapy, *62,* 554–563.
- Hochhauser, M., & Engel-Yeger, B. (2010). Sensory processing abilities and their relation to participation in leisure activities among children with high- functioning autism spectrum disorder.Research in Autism Spectrum Disorders, 4, 746–754.
- Johanna Darrah et al.,(2011) .Context therapy: a new intervention approach for children with cerebral palsy..Developmental Medicine Child Neurology 53(7): 615–620.
- Jones TL, Prinz RJ (2005). Potential roles of parental self-efficacy in parent and child adjustment: a review. Clinical Psychology Review. May;25(3):341-63.
- Kuhaneck, H. M., & Watling, R. (2015). Guest Editorial—Occupational therapy: Meeting the needs of families of people with autism spectrum disorder. American Journal of Occupational Therapy, 69
- Larry E. Dumka, et al., (2010) Parenting Self-Efficacy and Parenting Practices over Time in Mexican American Families. Journal of Family Psychology ; 24(5): 522–531.

- Larson, E. (2006). Caregiving and autism: How does children's propensity for routinization influence participation in family activities? OTJR: Occupational Therapy Journal of Research, 26(2), 69–79.
- Lauren M. Little (2012). Home and community activities: dimensions and associations with patterns of sensory response among children with autism spectrum disorders. A dissertation submitted to the faculty of the University of North Carolina at Chapel Hill.
- Lauren M. Little,et al., (2015). Activity Participation and Sensory Features Among Children with Autism Spectrum Disorders; Journal of Autism and Developmental Disorders;9
- Lisa Ruble,et al., (2012)Goal Attainment Scaling as an Outcome Measure in Randomized Controlled Trials of Psychosocial Interventions in Autism. Journal of Autism and Developmental Disorders September ; 42(9)
- Little, L. et al., (2014). Activity participation among children with autism spectrum disorder. American Journal of Occupational Therapy, 68, 177–185.
- Mary Spagnola,et al., (2007) Family Routines and Rituals :A Context for Development in the Lives of Young Children, Infants & Young Children Vol. 20, No. 4, pp. 284–299
- Marilyn Espe-Sherwindt (2008). Family-centred practice: collaboration, competency and evidence. The Author(s). Journal compilation, Support for Learning · Volume 23 · Number 3 ·
- Mary Law et al., (1996). The Person-Environment-Occupation Model: A Transactive Approach to Occupational Performance. Canadian Journal of Occupational Therapy 63: 9
- Orsmond, G. I., Krauss, M. W., & Seltzer, M. M. (2004). Peer relationships and social and recreational activities among adolescents and adults with autism. Journal of Autism and Developmental Disorders, 34(3), 245–256.

- Orsmond, G. I., & Kuo, H. Y. (2011). The daily lives of adolescents with an autism spectrum disorder Discretionary time use and activity partners. Autism, 15(5), 579–599.
- Orsmond, G. I,et al., (2013). Social participation among young adults with an autism spectrum disorder. Journal of Autism and Developmental Disorders, 43(11), 2710–2719.
- Potvin, M .et al.,. (2012). Recreational participation of children with high functioning autism. Journal of Autism and Developmental Disorders
- Reynolds, S., Bendixen, R. M (2011). A pilot study examining activity participation, sensory responsiveness, and competence in children with high functioning autism spectrum disorder. Journal of Autism and Developmental Disorders, 41, 1496–1506.
- Rush, et al., (2003). Coaching families and colleagues. A process for collaboration in natural settings. Infants & Young Children , 16 (1), 33-47.
- Sanja I. Cale, et al., (2009).Context-Based Assessment and Intervention for Problem Behavior in Children With Autism Spectrum Disorder, Behavior Modification 33(6) 707–742
- Schaaf, R. C., & Nightlinger, K. M. (2007). Occupational therapy using a sensory integrative approach: A case study of effectiveness. American Journal of Occupational Therapy, 61, 239–246.
- Schaaf, R. C., Toth-Cohen, S., Outten, G., Johnson, S., & Madrid, G. (2011). The everyday routines of families of children with autism: Examining the impact of sensory processing difficulties on the family. Autism Research, 15(3), 373–389.
- Schaaf, R. C.,et al.,. (2015). Linking sensory factors to participation: Establishing intervention goals with parents for children with autism spectrum disorder. American Journal of Occupational Therapy, 69
- Susan Strong et al., (1999) Application of the Person-Environment-Occupation Model: A practical Tool. Canadian Journal of Occupational Therapy 66: 122

- Sylvia Rodger ,Vidya Umaibala(2011). The Routines and Rituals of Families of Typically Developing Children Compared with Families of Children with Autism Spectrum Disorder: An Exploratory Study.British Journal of Occupational Therapy, 74,pg 120-26
- Slylvia Rodger et al.,(2011) Dinnertime and bedtime routines and rituals in families with a young child with an autism spectrum disorder. Australian Occupational Therapy Journal; 58(3):145-54
- Teri Todd and Greg Reid (2006).Increasing Physical Activity in Individuals With Autism. Focus on autism and other developmental disabilities volume 21, number 3, pages 167–176
- Tolley L, Atwal A. (2003). Determining the effectiveness of a falls prevention programme to enhance quality of life: An occupational therapy perspective. British Journal of Occupational Therapy 66(6):269-276.
- Tomchek, S. D., & Dunn, W. (2007). Sensory processing in children with and without autism: A comparative study using the Short Sensory Profile. American Journal of Occupational Therapy, 61, 190–200.
- Werner De Grace, B. (2004). The everyday occupation of families with children with autism. American Journal of Occupational Therapy, *58,* 543–550.
- Wendy Coster, et al.,(2008). Measuring participation of children with disabilities: Issues and challenges. Disability and Rehabilitation; 30(8): 639 – 64
- Zingerevich, C., & Patricia, D. L. (2009). The contribution of executive functions to participation in school activities of children with high functioning autism spectrum disorder. Research in Autism Spectrum Disorders, 3(2), 429–437

APPENDIX 1

CANADIAN OCCUPATIONAL PERFORMANCE MEASURE

Authorss
Mary Law,Sue Baptiste, Anne Carswell,
Mary Ann McColl,Helene Polatajko, Nancy Pollock

The Canadian Occupational Performance Measure (COPM) is an individualized measure designed for use by occupational therapists to
detect self-perceived change in occupational performance problems over time.

Client Name:

Age:	Gender:	ID#:
Respondent (if not client):		
Date of Assessment:	Planned Date of Reassessment:	Date of Reassessment:

Therapist:

Facility/Agency:

Program:

STEP 1:	**STEP 2**
IDENTIFICATION OF OCCUPATIONALPERFORMANCE ISSUES To identify occupational performance problems, concerns and issues, interview the client, asking about daily activities in self-care, productivity and leisure. Ask clients to identify daily activities which they want to do, need to do or are expected to do by encouraging them to think about a typical day. Then ask the client to identify which of these activities are difficult for them to do now to	**RATING IMPORTANCE** Using the scoring card provided, ask the client to rate, on a scale of 1 to 10, the importance of each activity. Place the ratings in the corresponding boxes in Steps 1A, 18, or 1C.

STEP 1A: Self-care

IMPORTANCE

Personal Care

(e.g., dressing, bathing, feeding, hygiene)

Functional Mobility

(e.g., transfers, indoor, outdoor)

Community Management

(e.g., transportation, shopping, finances)

STEP 1B: Productivity

Paid/Unpaid Work

(e.g., finding/keeping a job, volunteering)

Household Management

(e.g., cleaning, laundry, cooking)

Play/School

(e.g., play skills, homework)

STEP 1C: leisure

Quiet Recreation (e.g., hobbies, crafts, reading)

Active Recreation (e.g., sports, outings, travel)

Socialization (e.g., visiting,

Phone calls, parties, correspondence)

STEPS 3 & 4: SCORING - INITIAL ASSESSMENT and REASSESSMENT

Confirm with the client the 5 most important problems and record them below. Using the scoring cards, ask the client to rate each problem on performance and satisfaction, then calculate the total scores. Total scores are calculated by adding together the performance or satisfaction scores for all problems and dividing by the number of problems. At reassessment, the client scores each problem again for performance and satisfaction. Calculate the new scores and the change score.

Initial Assessment:		Reassessment	
OCCUPATIONAL PERFORMANCE PROBLEMS:	PERFORMANCE 1	SATISFACTION 1 PERFORMANCE 2	SATISFACTION 2
1.			
2.			
3.			
4.			
5.			

ADDITIONAL NOTES AND BACKGROUND INFORMATION

Initial Assessment:

APPENDIX 2

GOAL ATTAINMENT RATING SCALE

SCORE	PREDICTED ATTAINMENT
-2	Much less than expected outcome
-1	Less than expected outcome
0	Expected outcome after intervention
+1	Greater than expected outcome
+2	Much greater than expected outcome

APPENDIX 3

PARENTING SENSE OF COMPETENCE SCALE
(Gibaud-Wallston&Wandersman, 1978)

Please rate the extent to which you agree or disagree with each of the following statements.

Strongly Disagree	Somewhat Disagree	Disagree	Agree	Somewhat Agree	Strongly Agree
1	2	3	4	5	6

1. The problems of taking care of a child are easy to solve once you know how your actions affect your child, an understanding I have acquired. 1 2 3 4 5 6

2. Even though being a parent could be rewarding, I am frustrated now while my child is at his / her present age. 1 2 3 4 5 6

3. I go to bed the same way I wake up in the morning, feeling I have not accomplisheda whole lot. 1 2 3 4 5 6

4. I do not know why it is, but sometimes when I'm supposed to be in control, I feel more like the one being manipulated. 1 2 3 4 5 6

5. My mother was better prepared to be a good mother than I am. 1 2 3 4 5 6

6. I would make a fine model for a new mother to follow in order to learn what she would need to know in order to be a good parent. 1 2 3 4 5 6

7. Being a parent is manageable, and any problems are easily solved. 1 2 3 4 5 6

8. A difficult problem in being a parent is not knowing whether you're Doing a good job or a bad one. 1 2 3 4 5 6

9. Sometimes I feel like I'm not getting anything done. 1 2 3 4 5 6

10. I meet by own personal expectations for expertise in caring For my child. 1 2 3 4 5 6

11. If anyone can find the answer to what is troubling my child, I am the one. 1 2 3 4 5 6

12. My talents and interests are in other areas, not being a parent. 1 2 3 4 5 6

13. Considering how long I've been a mother, I feel thoroughly familiar with this role. 1 2 3 4 5 6

14. If being a mother of a child were only more interesting, I would be motivated to do a better job as a parent. 1 2 3 4 5 6

15. I honestly believe I have all the skills necessary to be a good mother to my child. 1 2 3 4 5 6

16. Being a parent makes me tense and anxious. 1 2 3 4 5 6

17. Being a good mother is a reward in itself. 1 2 3 4 5 6

APPENDIX - 4

Short Sensory Profile

SENSORY PROFILE
Winnie Dunn, Ph.D., OTR, FAOTA

Child's Name: _____ Birth Date: _____ Date: _____

Completed by: _____ Relationship to Child: _____

Service Provider's Name: _____ Discipline: _____

INSTRUCTIONS

Please check the box that **best** describes the frequency with which your child does the following behaviors. Please answer all of the statements. If you are unable to comment because you have not observed the behavior or believe that it does not apply to your child, please draw an X through the number for that item. Please do not write in the Section Raw Score Total row.

Use the following key to mark your responses:

- **ALWAYS** — When presented with the opportunity, your child always responds in this manner, 100% of the time.
- **FREQUENTLY** — When presented with the opportunity, your child frequently responds in this manner, about 75% of the time.
- **OCCASIONALLY** — When presented with the opportunity, your child occasionally responds in this manner, about 50% of the time.
- **SELDOM** — When presented with the opportunity, your child seldom responds in this manner, about 25% of the time.
- **NEVER** — When presented with the opportunity, your child never responds in this manner, 0% of the time.

Item	Tactile Sensitivity	ALWAYS	FREQUENTLY	OCCASIONALLY	SELDOM	NEVER
1	Expresses distress during grooming (for example, fights or cries during haircutting, face washing, fingernail cutting)					
2	Prefers long-sleeved clothing when it is warm or short sleeves when it is cold					
3	Avoids going barefoot, especially in sand or grass					
4	Reacts emotionally or aggressively to touch					
5	Withdraws from splashing water					
6	Has difficulty standing in line or close to other people					
7	Rubs or scratches out a spot that has been touched					
	Section Raw Score Total					
Item	**Taste/Smell Sensitivity**					
8	Avoids certain tastes or food smells that are typically part of children's diets					
9	Will only eat certain tastes (list: _____)					
10	Limits self to particular food textures/temperatures (list: _____)					
11	Picky eater, especially regarding food textures					
	Section Raw Score Total					
Item	**Movement Sensitivity**					
12	Becomes anxious or distressed when feet leave the ground					
13	Fears falling or heights					
14	Dislikes activities where head is upside down (for example, somersaults, roughhousing)					
	Section Raw Score Total					
Item	**Underresponsive/Seeks Sensation**					
15	Enjoys strange noises/seeks to make noise for noise's sake					
16	Seeks all kinds of movement and this interferes with daily routines (for example, can't sit still, fidgets)					
17	Becomes overly excitable during movement activity					
18	Touches people and objects					
19	Doesn't seem to notice when face or hands are messy					
20	Jumps from one activity to another so that it interferes with play					
21	Leaves clothing twisted on body					
	Section Raw Score Total					

0761638199

Item	Auditory Filtering	ALWAYS	FREQUENTLY	OCCASIONALLY	SELDOM	NEVER
22	Is distracted or has trouble functioning if there is a lot of noise around					
23	Appears to not hear what you say (for example, does not "tune-in" to what you say, appears to ignore you)					
24	Can't work with background noise (for example, fan, refrigerator)					
25	Has trouble completing tasks when the radio is on					
26	Doesn't respond when name is called but you know the child's hearing is OK					
27	Has difficulty paying attention					
	Section Raw Score Total					
Item	**Low Energy/Weak**					
28	Seems to have weak muscles					
29	Tires easily, especially when standing or holding particular body position					
30	Has a weak grasp					
31	Can't lift heavy objects (for example, weak in comparison to same age children)					
32	Props to support self (even during activity)					
33	Poor endurance/tires easily					
	Section Raw Score Total					
Item	**Visual/Auditory Sensitivity**					
34	Responds negatively to unexpected or loud noises (for example, cries or hides at noise from vacuum cleaner, dog barking, hair dryer)					
35	Holds hands over ears to protect ears from sound					
36	Is bothered by bright lights after others have adapted to the light					
37	Watches everyone when they move around the room					
38	Covers eyes or squints to protect eyes from light					
	Section Raw Score Total					

FOR OFFICE USE ONLY

Summary

Instructions: Transfer the score for each section to the Section Raw Score Total column. Plot these totals by marking an X in the appropriate classification column (Typical Performance, Probable Difference, Definite Difference).*

SCORE KEY

1 = Always	4 = Seldom
2 = Frequently	5 = Never
3 = Occasionally	

Section	Section Raw Score Total	Typical Performance	Probable Difference	Definite Difference
Tactile Sensitivity	/35	35 ------ 30	29 ------ 27	26 ------ 7
Taste/Smell Sensitivity	/20	20 ------ 15	14 ------ 12	11 ------ 4
Movement Sensitivity	/15	15 ------ 13	12 ------ 11	10 ------ 3
Underresponsive/Seeks Sensation	/35	35 ------ 27	26 ------ 24	23 ------ 7
Auditory Filtering	/30	30 ------ 23	22 ------ 20	19 ------ 6
Low Energy/Weak	/30	30 ------ 26	25 ------ 24	23 ------ 6
Visual/Auditory Sensitivity	/25	25 ------ 19	18 ------ 16	15 ------ 5
Total	**/190**	**190------155**	**154------142**	**141------38**

*Classifications are based on the performance of children without disabilities ($n = 1{,}037$).

Printed in the United States of America.

19 20 A B C D E

THE PSYCHOLOGICAL CORPORATION®

A Harcourt Assessment Company

0761638199

APPENDIX 5

MODIFIED HOME AND COMMUNITY ACTIVITIES SCALE

1	Household chores with parents	43	Making sand castle
2	Cooking meals with parents	44	Eating out with parents / friends
3	Caring for pets with parents	45	Going shopping with parents
4	Doing errands with parents	46	Maze activities
5	Animal model play	47	Outdoor playgrounds
6	Cleaning up room	48	Skipping
7	Picking up toys	49	Child play groups
8	Reading or looking at books	50	Playing arcade games
9	Telling child stories	51	Community celebrations
10	Adult child play times	52	Computer games
11	Talking walks	53	Playing dress ups
12	Bedtime stories	54	March past
13	Cuddling with parents	55	Exhibition rides
14	Cycling	56	Roller skating
15	Playing ball games	57	Hide and seek
16	Water play	58	Kite flying
17	Rough housing	59	Top and rope
18	Art activities/ drawing	60	Frog jumps
19	Playing board games	61	Treasure hunt with friends
20	Playing video games	62	Fishing with parents
21	Dancing /singing	63	Recreation or community centers
22	Listening to music	64	Swimming
23	Watching TV/ videos	65	Horseback riding
24	Playing alone	66	Animal farms
25	Family talks with parents	67	Parks
26	Praying	68	Zoos
27	Family meetings	69	Puppet play
28	Holiday dinners	70	Role play
29	Family members birthday	71	Children's museum visit
30	Decorating home with parents	72	Theater visit
31	Playing with siblings	73	Talking on the phone
32	Picnics	74	Posing for photograph
33	Having friends over to play	75	Music activities

34	Visiting neighbors with parents	76	Religious activities at home
35	Sleepovers /staying at relatives place	77	Going to temple or church
36	Doing yard work with parents	78	Field trips from school
37	Planting trees /flowers with parents	79	Karate
38	Growing vegetable garden with parents	80	Physical education
39	School	81	Cricket
40	Race activities	82	Basketball
41	After school care with parents	83	Shuttle /badminton
42	Car/bus rides		
SCORING: N=Never(0) M=Monthly(1) W=Weekly(2) D=Daily(3)			

APPENDIX 6

CONTENT VALIDITY FOR HCAS

Re: Fw: CONTENT VALIDITY

Anurupa Senapati <anurupasenapati@gmail.com>

Message body

Dear Ancy

I have gone through your modified HCAS. I think item no 20 and 23 are not valid activity to be included in the scale as it is not going to develop any productive skill rather it will deteriorate socialization. You may include two more activity. Tug off war. and Churning Milk with the help of parents.

Wish you all the best.

APPENDIX 7

MASTER CHART 1

COPM-Experimental group							
COPM P T1	COPM P T2	COPM P T3	COPM P T4	COPM S T1	COPM S T2	COPM P T3	COPM P T4
26.00	26.00	54.40	56.40	16.60	16.60	62.20	66.00
27.40	29.40	62.80	48.60	15.60	19.40	69.00	74.40
20.80	20.80	48.50	48.50	13.20	13.20	46.80	54.00
20.00	20.00	41.80	41.40	12.80	12.80	38.00	45.20
31.40	31.40	53.00	53.00	25.60	25.60	53.00	62.80
13.60	13.60	36.40	38.40	13.20	15.20	42.40	50.00
16.40	19.80	45.60	49.00	18.20	16.60	51.80	53.60
9.60	9.60	38.40	38.40	17.60	17.60	14.40	12.80
37.60	37.60	63.60	63.60	28.80	25.20	63.60	72.40
22.00	22.00	46.00	46.00	18.00	18.00	46.00	50.00
20.00	20.00	25.60	25.60	17.60	17.60	14.40	12.80
24.00	24.00	50.00	50.00	20.00	20.00	50.00	54.00
18.00	18.00	44.00	44.00	18.00	20.00	44.00	54.00

16.00	16.00	56.00	58.00	16.00	16.00	56.00	58.00
17.50	17.50	40.00	40.00	17.50	17.50	37.50	40.00
26.00	26.00	54.40	56.40	16.60	16.60	62.20	66.00

MASTER CHART 2

COPM-control group							
COPMPT1	COPMPT2	COPMPT3	COPMPT4	COPMST1	COPMST2	COPMPT3	COPMPT4
19.40	19.40	21.00	21.00	17.40	17.40	20.00	20.00
13.20	13.20	13.20	13.20	18.40	18.40	18.40	18.40
17.60	17.60	21.20	21.20	13.60	13.60	21.60	17.60
27.00	27.00	29.00	29.00	21.20	21.20	25.20	27.20
17.20	17.20	22.40	22.40	13.20	15.20	18.40	18.40
20.00	20.00	26.00	26.00	14.00	16.00	22.00	24.00
36.00	36.00	38.00	38.00	34.00	38.00	40.00	42.00
20.00	20.00	26.60	26.60	16.60	13.30	16.60	16.60

23.40	23.40	29.20	29.20	23.60	23.60	25.40	25.40
20.00	20.00	24.00	24.00	20.00	20.00	26.00	26.00
23.20	23.20	30.80	30.80	21.00	19.00	21.50	21.50
34.00	34.00	36.00	36.00	34.00	34.00	28.00	28.00
34.00	34.00	36.00	36.00	34.00	34.00	28.00	28.00
20.00	20.00	24.00	24.00	20.00	20.00	26.00	26.00
30.00	30.00	38.80	38.80	32.00	32.00	40.80	40.80
19.40	19.40	21.00	21.00	17.40	17.40	20.00	20.00

MASTER CHART 3

MASTER CHART 4

GAS Experimental group			
GAST1	GAST2	GAST3	GAST4
-2.00	-1.33	-.60	.30
-2.00	-2.00	-.66	.00
-2.00	-1.33	-1.33	.00
-2.00	-2.00	.00	-.33
-1.60	-1.66	.00	.33
-2.00	-2.00	-.66	.33
-2.00	-1.66	.33	.66
-1.66	-1.66	.33	1.00
-2.00	-2.00	-.33	.33
-2.00	-1.66	.00	.33
-2.00	-2.00	-.66	-.33
-1.33	-1.33	.00	.00
-1.33	-1.00	.30	1.00
-1.60	-1.60	.33	.66
-2.00	-2.00	-.66	.00

GAS Control group			
GAST1	GAST2	GAST3	GAST4
-2.00	-2.00	-1.66	-1.66
-2.00	-2.00	-1.66	-1.66
-2.00	-2.00	-1.33	-1.33
-2.00	-2.00	-2.00	-2.00
-1.33	-1.33	-2.00	-2.00
-2.00	-2.00	-1.66	-1.66
-2.00	-2.00	-2.00	-2.00
-2.00	-2.00	-2.00	-2.00
-2.00	-2.00	-2.00	-2.00
-2.00	-2.00	-2.00	-2.00
-2.00	-2.00	-2.00	-2.00
-1.33	-1.33	-2.00	-2.00
-1.33	-1.33	-2.00	-2.00
-2.00	-2.00	-2.00	-2.00
-2.00	-2.00	-2.00	-2.00

MASTER CHART 5

Parent sense of Competence-experimental group							
PSOCET1	PSOCET2	PSOCET3	PSOCET4	PSOCST1	PSOCST2	PSOCST3	PSOCST4
.87	.70	.89	.89	.50	.53	.62	.62
.64	.64	.64	.64	.57	.57	.57	.57
.87	.87	.75	.75	.40	.40	.57	.57
.75	.75	.72	.72	.37	.37	.38	.38
.77	.77	.83	.83	.51	.51	.61	.62
.95	.95	.95	.95	.83	.83	.83	.83
.91	.91	1.00	1.00	.68	.68	.83	.83
.81	.81	.83	.83	.40	.40	.44	.44
.83	.83	.85	.85	.42	.42	.48	.48
.62	.62	.89	.89	.51	.51	.61	.61
.45	.45	.18	.18	.50	.50	.33	.33
.64	.64	.68	.68	.53	.53	.59	.59
.64	.64	.72	.72	.51	.51	.59	.59
.70	.70	.87	.87	.70	.70	.77	.77
.70	.70	.72	.72	.50	.50	.51	.51

MASTER CHART 6

Parent sense of Competence-control group							
PSOCET1	PSOCET2	PSOCET3	PSOCET4	PSOCST1	PSOCST2	PSOCST3	PSOCST4
.75	.75	.70	.70	.61	.61	.48	.48
.81	.81	.83	.83	.74	.74	.74	.74
.45	.45	.58	.58	.83	.83	.62	.62
.60	.60	.64	.64	.68	.68	.58	.58
.37	.37	.37	.37	.81	.81	.62	.62
.93	.93	.83	.83	.66	.66	.62	.62
.95	.95	.95	.95	.57	.57	.62	.62
.83	.83	.83	.83	.66	.66	.66	.66
.52	.52	.75	.75	.81	.81	.62	.62
.83	.83	.85	.85	.42	.42	.48	.48
.87	.87	.89	.89	.61	.61	.64	.64
.70	.70	.70	.70	.59	.59	.59	.59
.52	.52	.75	.75	.81	.81	.62	.62
.89	.89	.82	.82	.50	.50	.50	.50
.70	.59	.59	.59	.59	.59	.59	.59
.75	.75	.70	.70	.61	.61	.48	.48

MASTER CHART 7

SSP-Experimental group															
AFT1	AFT2	MVT1	MVT2	TST1	TST2	URT1	URT2	T/ST1	T/ST2	LET1	LET2	VST1	VST2	TOTT1	TOTT2
6.00	6.00	12.00	12.00	7.00	7.00	19.00	19.00	4.00	4.00	30.00	30.00	5.00	5.00	83.00	83.00
6.00	6.00	6.00	6.00	4.00	4.00	11.00	11.00	4.00	4.00	30.00	30.00	7.00	7.00	72.00	72.00
6.00	6.00	15.00	15.00	7.00	7.00	11.00	11.00	4.00	4.00	30.00	30.00	5.00	5.00	78.00	78.00
6.00	6.00	6.00	6.00	25.00	25.00	19.00	19.00	18.00	18.00	30.00	30.00	13.00	13.00	117.00	117.00
6.00	6.00	9.00	9.00	27.00	27.00	14.00	14.00	4.00	4.00	24.00	24.00	13.00	13.00	97.00	97.00
6.00	6.00	15.00	15.00	12.00	12.00	11.00	11.00	16.00	16.00	30.00	30.00	5.00	5.00	95.00	95.00
6.00	6.00	6.00	6.00	7.00	7.00	32.00	32.00	16.00	16.00	30.00	30.00	8.00	8.00	105.00	105.00
6.00	6.00	4.00	4.00	16.00	16.00	24.00	24.00	4.00	4.00	30.00	30.00	15.00	15.00	99.00	99.00
6.00	6.00	12.00	12.00	7.00	7.00	11.00	11.00	4.00	4.00	30.00	30.00	5.00	5.00	75.00	75.00
6.00	6.00	12.00	12.00	12.00	12.00	25.00	25.00	12.00	12.00	30.00	30.00	10.00	10.00	99.00	99.00
6.00	6.00	12.00	12.00	7.00	7.00	11.00	11.00	4.00	4.00	24.00	24.00	7.00	7.00	71.00	71.00
8.00	8.00	3.00	3.00	22.00	22.00	17.00	17.00	4.00	4.00	24.00	24.00	7.00	7.00	85.00	85.00
6.00	6.00	15.00	15.00	10.00	10.00	11.00	11.00	4.00	4.00	30.00	30.00	5.00	5.00	81.00	81.00
6.00	6.00	15.00	15.00	11.00	11.00	7.00	7.00	4.00	4.00	30.00	30.00	7.00	7.00	80.00	80.00
6.00	6.00	12.00	12.00	29.00	29.00	22.00	22.00	8.00	8.00	30.00	30.00	23.00	23.00	130.00	130.00

MASTER CHART 8

SSP –Control group															
AFT1	AFT2	MVT1	MVT2	TST1	TST2	URT1	URT2	T/ST1	T/ST2	LET1	LET2	VST1	VST2	TOTT1	TOTT2
6.00	6.00	15.00	15.00	7.00	7.00	11.00	11.00	4.00	4.00	30.00	30.00	5.00	5.00	82.00	82.00
24.00	24.00	15.00	15.00	15.00	15.00	22.00	22.00	4.00	4.00	30.00	30.00	5.00	5.00	100.00	100.00
6.00	6.00	12.00	12.00	10.00	10.00	7.00	7.00	4.00	4.00	30.00	30.00	5.00	5.00	68.00	68.00
26.00	26.00	14.00	14.00	26.00	26.00	31.00	31.00	16.00	16.00	27.00	27.00	25.00	25.00	165.00	165.00
6.00	6.00	15.00	15.00	9.00	9.00	17.00	17.00	4.00	4.00	30.00	30.00	10.00	10.00	91.00	91.00
6.00	6.00	6.00	6.00	10.00	10.00	10.00	10.00	4.00	4.00	30.00	30.00	5.00	5.00	71.00	71.00
6.00	6.00	15.00	15.00	9.00	9.00	7.00	7.00	4.00	4.00	30.00	30.00	5.00	5.00	76.00	76.00
24.00	24.00	15.00	15.00	4.00	4.00	34.00	34.00	20.00	20.00	30.00	30.00	20.00	20.00	150.00	150.00
6.00	6.00	12.00	12.00	23.00	23.00	12.00	12.00	5.00	5.00	30.00	30.00	22.00	22.00	110.00	110.00
35.00	35.00	15.00	15.00	22.00	22.00	35.00	35.00	4.00	4.00	30.00	30.00	15.00	15.00	133.00	133.00
6.00	6.00	12.00	12.00	10.00	10.00	12.00	12.00	4.00	4.00	30.00	30.00	5.00	5.00	79.00	79.00
6.00	6.00	15.00	15.00	9.00	9.00	17.00	17.00	4.00	4.00	30.00	30.00	10.00	10.00	91.00	91.00
6.00	6.00	3.00	3.00	12.00	12.00	21.00	21.00	4.00	4.00	30.00	30.00	10.00	10.00	86.00	86.00
6.00	6.00	9.00	9.00	7.00	7.00	10.00	10.00	4.00	4.00	30.00	30.00	5.00	5.00	79.00	79.00
6.00	6.00	15.00	15.00	9.00	9.00	17.00	17.00	4.00	4.00	30.00	30.00	10.00	10.00	91.00	91.00